adio Controlled *Indoor* Models • Norm Deitchman's SE-5

MODEL AIRPLANE NEWS

May 1959 — 35 cents

The FIRST .45 R.C.
Of Course it's... TORPEDO
with R.C.F.*

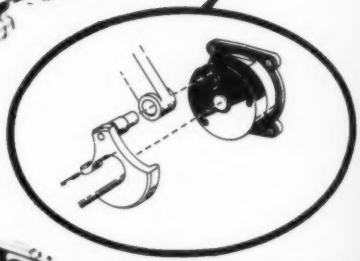
The demand of today's larger aircraft and increased radio control equipment in multichannel flying makes it mandatory that the horsepower in the nose of present day models be increased. After a year of experimenting and testing with top R.C. modelers from the east to the west coast it became evident that a .45 would be the correct engine for today's multichannel aircraft . . . now it is here and available to you . . . the TORPEDO .45R.C.

For Radio Control Flying at its best
it's the **TORPEDO .45R.C.** with **R.C.F.**

$27.95

The **TORPEDO .45R.C.** *brings with it the most exciting advancement ever to take place in the balancing of single cylinder model airplane engines.* It is equipped with **R.C.F.** *(Rear Counter-balancing Flywheel)* and an **exhaust baffle control** linked to the **"Multi-Speed" carburetor. R.C.F.** is a major factor contributing to its outstanding horsepower as well as its unusual smoothness at all speeds. Bearing life, too, is greatly increased with **R.C.F.** The exhaust baffle control and **"Multi-Speed" carburetor** provides the slowest, smoothest idling possible. Add these features to the famous **TORPEDO** engineering and you have a **.45R.C.** with a *full range of effortless performance.*

NOTE: Modelers flying at altitudes above 3000 feet will discover that the **TORPEDO .45R.C.** has the horsepower necessary to provide top performance.



*Rear Counter-balancing Flywheel

$19.95

TORPEDO .45

The new **TORPEDO .45** is designed for those who prefer a large class C engine *without excessive weight.* The **TORPEDO .45,** too, is equipped with **R.C.F.*** to create a powerful flight with vibration at the absolute minimum.

K&B Allyn

K&B ALLYN COMPANY • 5732 DUARTE STREET • LOS ANGELES 58, CALIFORNIA

Way Out in Front in Performance and Value

COMET'S Ready-to-Fly All-Plastic Gas Models and Ready-to-Run Racing Car

Snark SM-62 TRUE-TO-SCALE Intercontinental GUIDED MISSILE

PLM-47 $14.95

Ready-to-Fly, True-to-Scale, U-Control GAS MODEL. High-Impact Plastic. Complete with LAUNCHER, Control Handle and Lines and .049B "OK" Cub Engine with Auto-Recoil Starter.

A scale version of the Air Force's dramatic intercontinental missile, modified for thrilling control flights! Big—18⅜" long; beautiful—in rich red and yellow plastic; complete—with mobile 6-wheel launcher, powerful engine, control handle and lines, in striking 4-color box.

Length 18⅜"
Span 13⅛"
Weight 7¼ oz.

COMMENDED BY THE CHILDREN'S LIBRARIAN SERVICE BUREAU OF PARENTS' MAGAZINE

Complete with Gas Engines

Regulus SSM GUIDED MISSILE

Length 14⅜"
Span 14"
Weight 6 oz.

Ready-to-Fly, U-Control GAS MODEL. High-Impact Plastic. Complete with .049A "OK" Cub Engine and Twist-Cord Starter, Control Handle and Lines

This model has only one rival in value—Comet's own Tri-Pacer! Smart, sleek; blue-and-white color scheme; 14⅜" long; cushion-rubber tires, tricycle landing gear, colorful decals. Complete with engine, starter, control handle and lines in a full-color chest.

High Impact Plastic

AVAILABLE JUNE 1st

PLM-31 $7.95

PLR-3200 $11.95

BELOND AP Special Engine Powered RACING CAR

TRUE-TO-SCALE

Ready-to-Run, High-Impact Plastic. Complete with .074 "OK" Cub Engine with pull starter, Bridle and Tetherlines.

Replica of the racing car that won the 1957 and 1958 Indianapolis Speedway classics, beautifully molded in dazzling yellow plastic! Genuine rubber tires, decals, driver, bridle and tetherlines—ready-to-run! Telescoping 3-color box.

Length 11"

COMET MODEL HOBBYCRAFT, INC.

501 WEST 35TH STREET, CHICAGO 16, ILLINOIS

Send for these 2 BIG COMET BOOKS:

The New Comet Catalog—**10c**; shows hundreds of models in color. 20-Page Book—"What Makes An Airplane Fly"—lots of pictures and diagrams—printed in 2 colors—**25c**.

P. G. F. CHINN

Foreign Notes

GREAT BRITAIN

1959 marks the Golden Jubilee of the model flying movement in the United Kingdom. Fifty years ago, on January 21, 1909, the Kite Flying Association was founded at Caxton Hall, London, under the presidency of Major B. Baden-Powell. Soon afterwards, the name was changed to the Kite and Model Aircraft Association and recognition by the Royal Aero Club obtained. Then, in the early 1920's, the K.M.A.A. was completely re-organized under the title of the Society of Model Aeronautical Engineers, the national body which governs the movement in Britain to this day and is probably the oldest organization of its kind anywhere.

AUSTRALIA

Three records were broken at the recent Australian Nationals held at Camden, 25 miles from Sydney, N.S.W. Stunt Champion Bob Hyde clocked 18 minutes plus, to set a new towline glider record. The Rice-Farnan speed team set a new figure of 110.2 mph in Class I (.15 cu. in.) speed, using Class II (.012) lines. Motor was a stock, but well broken-in O.S. Max-II 15 turning a Tornado 6/8 on 30 percent nitro. Model was fiberglassed with all-fiberglass pan. Third record was Kevin Green's 36 min. 53 sec. total in the One-hour Scramble in which 58 models took the air at the start, flights being restricted to a two-minute maximum. Green, like nearly all other Scramble contestants, used a Mills .045 diesel.

In the Stunt event, O.S. powered Thunderbirds took first and second, Bob Hyde winning for the second succcessive year, with Tony Farnan second. Top appearance points went to third place winner Ken Taylor, who flew a very beautiful Max-35 engined 60-inch original. Junior stunt was again won by Doug Harlow (Max-29 original). Engines used for stunt were mostly O.S., Fox, K&B and Australian Burford 29's and 35's.

The A Class team race was, as usual, an Oliver-Tiger benefit and was won by J. Ray. W. Penfold of South Australia won Class B with an Enya 29-III powered ship. Class B now appears to be developing into a fight between Enya and O.S. Tony Farnan's Max-29 was reported to be clocking 97 mph and 60 laps, but was eliminated when Farnan put his foot in the prop. The Class C team race—an event, like the Scramble, peculiar to the Australian contest calendar—went to Mike Ware of Queensland (Max-35).

Speed was not too well supported. Jack Finneran won Class II with a Dooling 29 at 127 mph. Bruce Dawe's Monoline McCoy 60 took Class III at 138 mph. In Combat, 30 of the 40 entries were using O.S. engines. Winner was Brian James of New South Wales.

Wakefield rubber and FAI gas both went to the noted Australian free-flight expert and modeling writer, Jim Fullarton. His power model had an auto-elevator to control the climb and was fitted with an O.S. Max-15 motor.

In RC, the equipment was, in general, more impressive than the flying. One Queensland entrant achieved Australia's best RC crackup to date when his Ohlsson

(*Continued on page* 52)

Guillow's

TOP QUALITY • TOP VALUE

GAS MODEL AIRPLANES

★ *RADIO CONTROL*
★ *FREE FLIGHT*
★ *U-CONTROL*

STUNT • COMBAT • TRAINERS

Brand New! 20" WING SPAN CONTROL LINE MODEL

The SKY KING

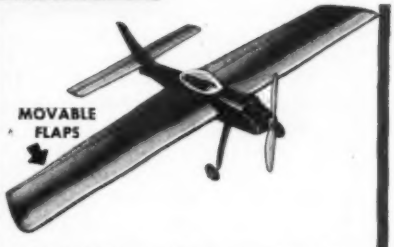
$1.79 less motor and propeller

Features:

- Airfoiled balsa wing
- Complete hardware package
- Flying lines and control handle
- Sturdy motor mount system and new angle poised landing gear arrangement

Completely pre-fab kit designed primarily for the .020 engine — also easily adapted for .049 motors. Designed and guaranteed to "stay out on the lines" even in high winds. No equal for flight performance and durability in its class.

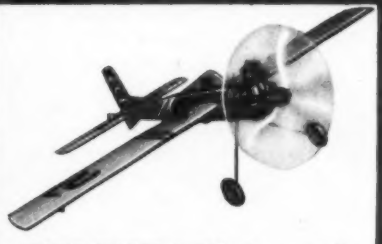
EXPLORER 56" wing span R/C model. Wing area 560 sq. in., Engine .15 to .25. $14.95



BARNSTORMER MARK 2 U-control stunt model. 47" wing span, wing area 470 sq. in., Engine .19 to .36. $7.95

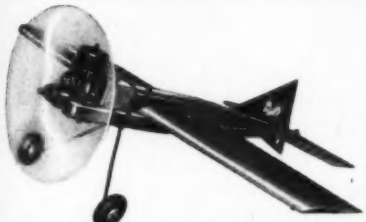
BABY BARNSTORMER ½A U-control stunt. Wing span 23½". Wing area 118 sq. in., Engine .035 to .049. $3.25

PROFILE TRAINER 1 Ideal control line model for small engines from .049 to .099. 24" wing span. $3.25

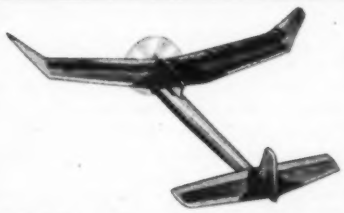


PROFILE TRAINER 2 30" wing span U-control model for engines from .14 to .19. Rugged — dependable. $4.50

PROFILE TRAINER 3 Giant 36" wing span U-control trainer for engines from .19 to .36. Best value. $5.95



RAT RACER U-control model for Rat Race event. 24" span — for engines .25 to .40. Indestructible! $4.50



KIWI ½A 35" wing span free flight model. $2.95
KIWI A 48" wing span free flight model. $4.95

New low price!

TRIXY 45" span, swept wing U-control model stunt, combat or sport flying — for .19 to .36 engines $5.95

If not available at your Hobby Dealer send direct to factory adding 25c packaging and postage in U.S.A., 40c outside U.S.A.

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30th Year of Publication

MODEL AIRPLANE NEWS

M.A.N.

JAY P. CLEVELAND, President and Publisher

May 1959 Vol. LX, No. 5

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by William Winter

► More than 5,000 devotees of the home-built airplane now belong to the six-year-old Experimental Aircraft Association. In 1953, the EAA was a gleam in a mimeograph machine's eye, so to speak. Today, EAA has chapters throughout the United States and members in 25 other countries. It publishes a highly professional slick paper magazine, Sport Aviation, and manuals, such as Data Book 1959, Typical Lightplane Fuel System, Amateur Builder's Manual, which are a delight to any airplane lover's eye. EAA sponsors a yearly fly-in attended by dozens upon dozens of home-builts—low wings, cabin jobs, midwings, bipes—delightful looking ships, safe to fly, meticulously built (and why shouldn't they be, since practically everyone in the movement is a model builder!).

At the 1960 Fly-In, entries will be judged in an International Design Competition (tentatively $5,000) for a safe, practical utility plane with folding wings, which can be kept in a garage and towed to the airport.

EAA and home-built airplanes add up to an incredible story. Begun by a group of home builders in Milwaukee in 1953, EAA is staffed by a handful of dedicated people who work for nothing, husbands and wives, who in 1958 got out 83,000 pieces of mail from a basement!

CAA (now FAA) co-operates with the home builders to keep things safe, and on the up-and-up. From various companies and individuals you can buy detailed plans for airplanes that would be a credit to the airplane manufacturing industry. Planes have been built in schools, and by women. Some members go in for "vintage" aircraft, which might be anything from a Fokker Triplane, Nieuport 28, or Camel, to the more "modern" stuff, like Waco 10's, Monocoupes, Fairchilds and Stinsons.

It takes skill and responsibility to make these things. Probably most of the home builders have prior skill in welding, woodwork, etc. Those who don't, go out and get it, by going to school, or working in useful places. It costs, say $1000 to $1500, and three years time, to make a home-built. So many hundreds of home-builts have been built or are under construction that it is getting tough to scrounge cheaply, materials and engines. The 65 hp plants of recent years already are in short supply.

The home-built movement had to happen. In post-war years, the industry has had to follow the market. Planes were made for (*Continued on page 70*)

NEXT MONTH'S COVER Skyhopper

SUBSCRIPTION PRICES

U.S. & POSSESSIONS: 1 year $4.00; 2 years $6.50; 3 years $9.00
CANADA: 1 year $4.50; ALL OTHER COUNTRIES: 1 year $5.50
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PLANE ON THE COVER

The Sablar Special, a glamorous home-built aircraft by Tony Sablar, was inspired by the Knight Twister, itself a great modeler's favorite before WW 2. An 85 hp Continental affords a snappy 150 mph top and a cruise of 130 mph. Tony is a member of the Experimental Aircraft Association. As to the cover itself, artist Jo Kotula outdid himself.

it's the famous . . .

OK CUB .049A

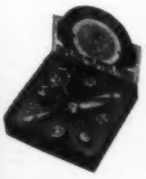
now only **$3.95**

***Complete with* FUEL-VUE NYLON TANK**
HIGH IMPACT PROPELLER • SPIN STARTER

Yes! Here is the engine value of the year. It's the genuine OK Cub .049A engine at a never before heard of price. Our new attractive package saves you money. No need now for you to have any engine but the best. Ideal for both free and control line flight. Here are just a few of the exclusive OK features:

● **Special Bearing Quality Die Cast Crankcase** ● **Hardened Aircraft Steel Crankshaft** ● **Fuel-vue Nylon Tank** ● **Patented 360° Porting** ● **Replaceable Glow Plug**

NEW LOW PRICES — BETTER VALUES THAN EVER ★ ★ ★

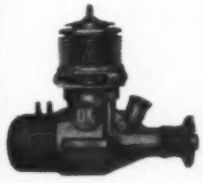


"OK" CUB .049B Power Kit **$3.95**

"OK" CUB .049B **$4.95**

"OK" CUB .074 **$5.45★**
"OK" CUB .099 **$5.95★**

"OK" CUB .14 **$6.95★**
"OK" CUB .19 **$7.95**



"OK" CUB .29 **$11.95**
"OK" CUB .35 **$12.95**

"OK" CUB DIESELS
.049 **$6.95**
.075 **$7.95**

OK GLOW FUEL

Specifically developed to give maximum life and performance with all OK engines (and other engines of similar compression ratios), OK Glow Fuel is a scientifically compounded methanol-base fuel, heavily fortified with nitrates. High heat resistant silicone lubricants won't thin under engine heat.

45c ½ PT. **80c** PT. **$1.40** QT.

OK Diesel Fuel for CUB Diesels . . Pint 80¢

OK GLOW PLUGS

"OK" Glow Plugs have a superior platinum glow element for fast starts, ease of acceleration, highest speed. Available in two sizes.

G-2 for Cubs 19, 29, 35 and all other makes using 1/4-32 long type plugs.

G-3 for all Cubs .039 to .14 and all other makes using 1/4-32 short type plug.

49c

OK ACCESSORY SET

Just the right fuel . . . just the right accessories for satisfactory engine operation! Contains:

- ½ pint OK Glow Fuel
- 1 filler spout with tubing
- 1 set battery leads assembled, soldered; battery connection and glow plug clip
- 1 comb. plug wrench and screw driver

$1.25

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OUR 27th YEAR OF SERVICE TO MODELERS
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SPEED PANS
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NEW

. . . an unbeatable R/C Combination that Challenges ANY COMPARISON!

AMTRON "Vanguard" TWIN TUBE R/C OUTFIT PRINTED CIRCUIT

Here's the Precision Equipment You Always Wanted . . . at a Fraction of What You'd Expect to Pay!

We ask every R/C fan to order and compare this truly precision engineered R/C equipment. Examine it for 14 DAYS FREE! If you aren't convinced that it's equal to and superior to ANY SET selling up to twice the price, return it for full refund! No Questions Asked!

OPERATES ANY MODEL . . . BOATS, CARS & PLANES
From ½A to the Very Largest • Up to 1½ Miles

"VANGUARD" RECEIVER is a superior quality outfit—unmatched for reliability, accuracy and performance. It will fit into just about any model you can find, weighs a mere 1¼ ounces (including relay) and measures 1½" x 2" x 1". Despite its light weight and compact design, it is one of the finest precision R/C instruments ever made. Other features include: One stage single tuning • All printed circuits • Twin diodes • Accurate & positive pin point control at all ranges • Low .15 battery drain as compared with .3 or .4 on most receivers • Saves you countless $$$ on battery costs • No pot required • 22½ Volt battery operation • Transformer that eliminates sensitivity control • New improved 1AG4 tubes • Super sensitive 5000 Ohm Jaico relay • Plastic case • All prefabricated & easy to assemble • Complete Instructions & Diagrams Included.

SALE PRICED AT LESS THAN THE REGULAR WHOLESALE COST!

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GET BOTH THE RECEIVER AND TRANSMITTER KITS
Both for only **$24.95**
A Guaranteed $39.95 Plus Value

ASSEMBLED OUTFIT
Same as Above, But Ready-To-Operate ALL "FINISHED, TESTED AND ASSEMBLED READY FOR USE. **$34.95** Less Batteries

INDIVIDUAL PRICES

"Vanguard" RECEIVER KIT with All Components, less batteries	$12.95
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RETURN IN 14 DAYS IF NOT 100% SATISFIED

We want you to prove to yourself the excellence and terrific value of these AMTROM "VANGUARD" R/C instruments by actually examining them FREE for 14 days. If this isn't the best buy you ever saw, return UNUSED and you get every penny refunded.

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Finest Quality • Fully Guaranteed • Order Now

½ PRICE $1.98 R/C Deluxe Receiver INSTALLATION KIT **98c**

CRYSTALS 27.255 mc. $6.50 VALUE **2.89**
New R/C MC Bands Sale! 26.995; 27.045; 27.095; 27.145 or 27.195 **3.95**

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0-5	3.95	2.95
0-50	2.75	2.29

	REG.	SALE		REG.	SALE
4000 OHM SIGMA RELAY	$2.95	$1.69	R/C MULTITESTER	$16.95	$12.95
HEX. ALIGNMENT TOOL	.45	.29	REED BANKS (3)	24.95	14.95
S.N. ESCAPEMENT	3.95	2.95	5 Bank 15.45 6 Bank		18.95
Special 1AG4 R/C Tubes	2.95	1.79	KEYING SWITCH	.45	.29
XFG1 R/C TUBE	3.85	2.95	PLUG & JACK SET	.25	.15
3A5 R/C TUBE	1.25	.98	COMPOUND ESCAPEMENT	5.95	3.95

NEW, LOW-PRICED

PRECISION RADIO CONTROL OUTFIT

Here It Is! The Sensational, New AMTRON "SPACE CADET"

Get Both receiver and transmitter . . . plus tubes, escapement, crystal, etc. All for the one low price!

$25.00 Value **$14.95*** IS ALL YOU PAY

*Less Batteries, Only.

One of the most dependable performing R/C OUTFITS we've ever seen (second only to our deluxe "Vanguard" Outfit). FULLY TESTED, too, and GUARANTEED to operate all models . . . from Half-A to the very biggest. Very simple assembly, too! Operates on 27¼ mc., Range 1 - 1½ miles. Features a lightweight, compact RECEIVER . . . weight under 3 ounces. An extremely accurate performer, with all deluxe components. Powerful, hand held TRANSMITTER . . . a truly precision instrument . . . complete with metal case. The new Amtron "SPACE CADET" is all prefabricated, comes with easy to follow assembly instructions. It's easy to operate, too!

ABOVE OUTFIT ALL ASSEMBLED Ready-To-Operate FINISHED TESTED & ASSEMBLED! Less Batteries **23.95**

INDIVIDUAL PRICES Less Batteries, Only

Space Cadet Receiver Kit	$6.95
Receiver Assembled	10.95
Space Cadet Transmitter Kit	8.95
Transmitter Assembled	12.95

R/C FANS!

AHC HAS EVERYTHING YOU WANT! EVERY BRAND! ALL PARTS AND ACCESSORIES! SEND US YOUR ORDER AND GET ALL THE AHC EXTRAS!

Field Strength Meter 9.95
A real buy! Complete! Wired, adjusted and Ready-to-Operate. In plastic case. "AMTRON"

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CG RI Kit 19.95 (Assembled)	26.95
CGRT1-3V 39.95 CGRX-1	34.95
Deltron R100 (Assembled)	24.95
Deltron R109 (Assembled)	29.95
Raytrol #100 13.95 200	19.95
Super A'trol 13.95 (Assembled)	19.95
Tone Aerotrol (Assembled)	24.95

Receivers—Multi Channel

(2) Babcock BRC-7	69.95
(2) Citizenship RER	44.95
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(5) CG RT5 (Assembled)	119.50
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RAYTROL: (3) Assembled	64.50
(8) 86.00 (6)	91.75

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Magic Wand Kit 19.95 Asmbld.	24.95
Bedoco (Assembled)	34.95
Cit'ship Kit 15.95 Assembled	19.95
MKT Cit'ship Kit Transistor	19.95
MTK Cit'ship Assembled	26.95
Citizenship 465MC (Assembled)	34.95
Citizenship 465MC Transistorized	26.95
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Deltron T99 (Assembled)	21.95
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Super A'trol 19.95 (Assembled)	34.95
Tone Aerotrol (Assembled)	44.95

Transmitters—Multi Channel

(2) Babcock 465MC (Assembled)	69.95
(2) Citizenship REX (Assembled)	39.95
CGT3 89.95 CGT5	99.50
(5) Cit'ship CGT5 Assembled	89.95
(8) Citizenship MST-8	99.95
RAYTROL: (3) (Assembled)	55.00
(8) 66.75 (6)	79.30

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Gem Relay 8000 ohm 4.25; 7800	5.45
Sheer Aerotrol Escapement	3.95
Sert. DE Relay 7.00 Comp. Escap.	5.95
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Cameron SN Escape (2 pos.)	5.95
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Babcock Elevator Servo	12.00
Bonner VariComps: Single	8.95
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Bonner Servo - 14.95 SN Escap.	5.95
Multi-Servos 2 PN 11.95; 3 PN	14.95
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Multi-Servo Rudder L or R	10.95
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Bellcrank & Horn (RC)	.75
Relay (Amtron) Super Sensitive	3.95
Installation Kit	1.00
U-15 Battery Box 1 cell .30; 2 cell	.50
Battery Boxes: 1 cell .25; 2 cell	.50
3 cell .65; 4 cell .85; specify battery	
Tubes: XFG1 3.85; 3A5 - 1.25; 1AG4	2.95
3V4 1.75; 1U4 1.75; 1U5	1.80
Test Meter (Citizenship)	22.95
Batteries: XX45 or 467, 67½V	3.50
XX30 or 455, 45V	2.45
4F or 742, 1½V	1.25
U15 or 412, 22½V	1.50
0-3 Milliameter 4.95 0-50	2.75

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USE HANDY AHC ORDER BLANK NEXT PAGE ➡

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"BABCOCK" R/C INSTRUMENTS

2 CHANNEL 465 mc.

Transmitter BCT-7
By far the finest, most reliable unit made.

REG. 69.95 **34.95**

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SINGLE CHANNEL TONE RECEIVER BCR-8

FOR USE WITH ABOVE TRANSMITTER See Below

REG. $39.95 **19.95** 5 Kc. or 7 Kc.*

*Your choice of either 5 Kc. or 7 Kc. useable with above Transmitter for operation of either or both units.

NO TUBES! COMPLETELY TRANSISTORIZED!

One of the finest, most reliable, most sensitive precision units you can buy. Features a unique advanced circuitry that offers interference immunity. Uses the popular 5K super sensitive relay. Has rugged, metal case and built-in battery holder. Only 6½ ounces. Simple to install. Simple to use. Wing antenna plus full installation instructions and diagram booklet included. Fully factory assembled and tested.

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These Babcock units, when used together, make a terrific R/C team. If multi control is desired (using one Receiver) you will need a Compound Escapement. We will give you one of the finest made . . . the Babcock Mark II Super Compound Escapement ABSOLUTELY FREE if you purchase the above Receiver and Transmitter together ($54.90).

Limited Quantity! Rush your Order!

LOOK

Place Your Order FOR THE NEW, FABULOUS FOX .099 only **4.95**

We're taking advance orders right now! We saw a preview of the Fox .099 engine recently — and it's terrific! At $4.95, we predict they'll be sold out quick. We suggest you send your order to us immediately. We'll reserve your engine and ship it as soon as received!

ON SALE "HI-PULSE" Jet Engine

$32.95 VALUE **19.95**

Super bargain! Big 3½ lb. thrust. Size: 21¾" long, 2½" diam. Weighs 14 oz. Order this AHC special while the supply lasts!

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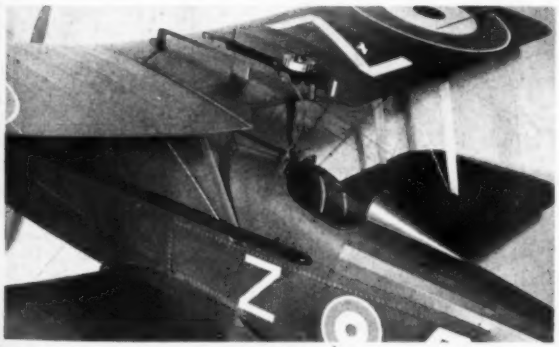
America's Hobby Center, 146 W. 22nd St., N. Y. 11, N. Y.

the SE-5

by NORMAN DEITCHMAN

Admirable model, flier. Proportions of real ship including scads of dihedral, make for ample stability in miniature.



Fabric stitching on fuselage, flexible Lewis gun, among true-to-life details visible here. Rugged SE-5 could dive with Albatros.

Cockpit details include scale instruments. Author's model weighs 30 ounces, raises tail after 10-foot run, takes off in 30 on .09.

Historic WW 1 pursuit lives again in a sparkling, incredibly accurate flying model for .09 to .15. Just fan our brow!

► The SE-5 made its appearance in 1916 but did not become fully operational until March 1917 when the first batch was delivered to No. 56 Sqdn., on the western front. At first the SE-5 was not too well accepted since most of the experienced combat pilots preferred the maneuverability of the rotary-engined machine (Camel) whose excessive torque could always be relied upon to quick spin or roll and get out of a tight spot. However, this same characteristic caused many inexperienced pilots to crash to their death.

The SE-5 soon gained much respect, forgiving many pilot errors, due to her great inherent stability. And she could dive at high speeds keeping up with the deadly Albatros and not break up on recovery.

The model is easy to trim and very realistic in its flight pattern. Careful attention is paid to scale shapes and details. Your model can be built without full scale details if desired, but building materials should be carefully selected in any case.

CONSTRUCTION

Fuselage: Cut two sides out of ⅛" sheet balsa. Cut out the three slots to admit lower wing roots and former #6. Mark off position where the ⅛" I.D. (inside-diameter) aluminum tubing goes and use a small rattail file to make holes. Make a shallow cut along outside of fuselage sides along where former #7 goes to allow for creasing. Cut out all formers.

Bend 1/16" wire struts and landing gear to shape. The landing gear should be *(Continued on next page)*

the SE-5 *continued*

formed in one piece. Start at the center of your wire length and work toward both ends. Note the true length on front view. Carefully measure and mark the wire before you bend, leaving the back end of the wire long and finishing bending after fuselage is assembled.

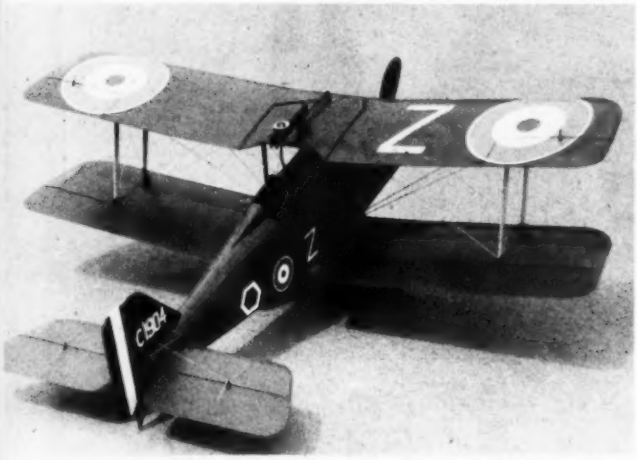
Mount all the wire parts on to their respective formers, binding with thin copper wire twisting together in back. Check against side view on plan and bend strut wires to shape shown. Be accurate here as the angles will help determine your wing alignment. Assemble fuselage by cementing the formers in place. Check to see that there is no twist developing. Cement balsa block to tail-end of fuselage against F-12 and sand to shape.

Slip hardwood engine mounts into place and cement well. The mounts were designed to accommodate larger than an .09 engine if desired. If a .15 is to be used, simply shave away the inside of the mounts until the engine fits. Set engine in place, mark off and drill holes for engine bolts. Don't forget the three degrees right-thrust off set. Decide on the size fuel tank you will require and install it on the mounts behind the engine.

Cement 1/16" sheet to bottom rear of fuselage. Make up skid assembly as shown, add 1/32" wire skid and install as unit. A strip of silk along the sides should be used to reinforce to bottom sheeting. The landing gear wire can now be bent to finished length.

Cement a 1" wide strip of ¾" ply across bottom of fuselage below F-5, drill out and bind landing gear. Wire to it. Cover remainder of flooring with ⅛ balsa. Cut out the bottom section between F-1 and F-2 and mount on a cloth hinge making a hatch to get at the engine. This can be secured with a rubber band or pin.

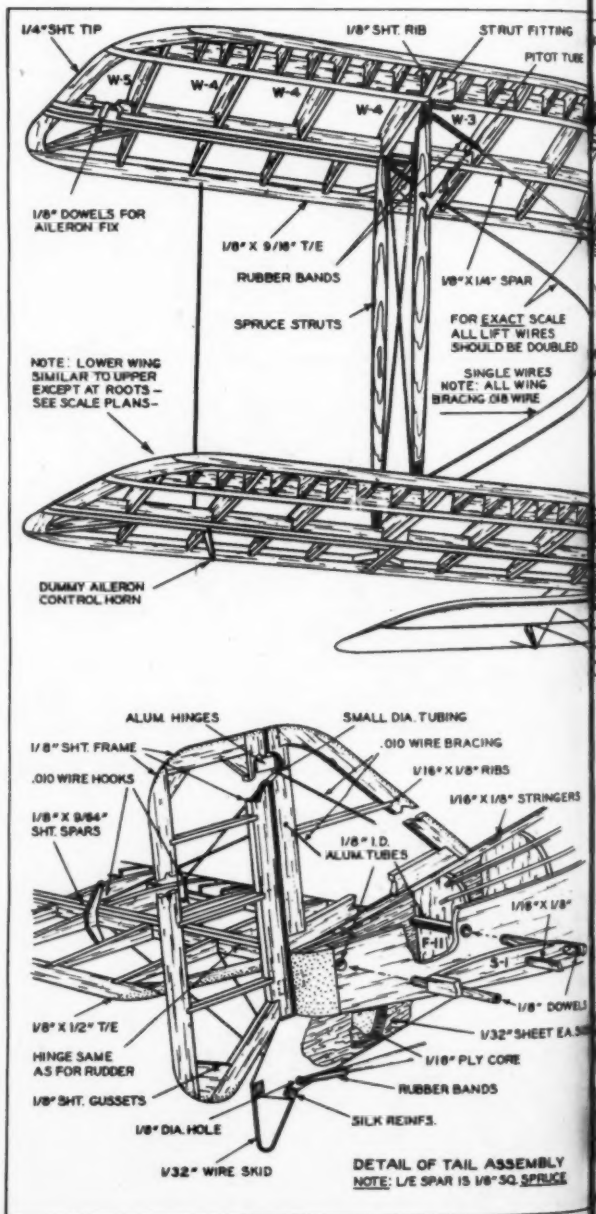
If you intend to furnish the cockpit, now is the time



Four coats of clear dope, and two of colored, gives a lifelike finish. Wings made in four panels, and wiring shown is to scale.

Little touches add to the picture. Radiator shutters are painted aluminum, wire wheel spokes show through fabric covered wheels.

Markings are those of No. 85 Squadron, RFC and, on the tires, it says Palmer Cord Aero Tyre. Suppose that wires sing in the wind?



to do it. The instrument panel is drawn full size on the plan. Note the forward slant. This was done to clear the Vickers gun breech. Postwar machines were modified and the panel was set vertical, the gun being removed and some of the instruments rearranged. Add the stick and seat.

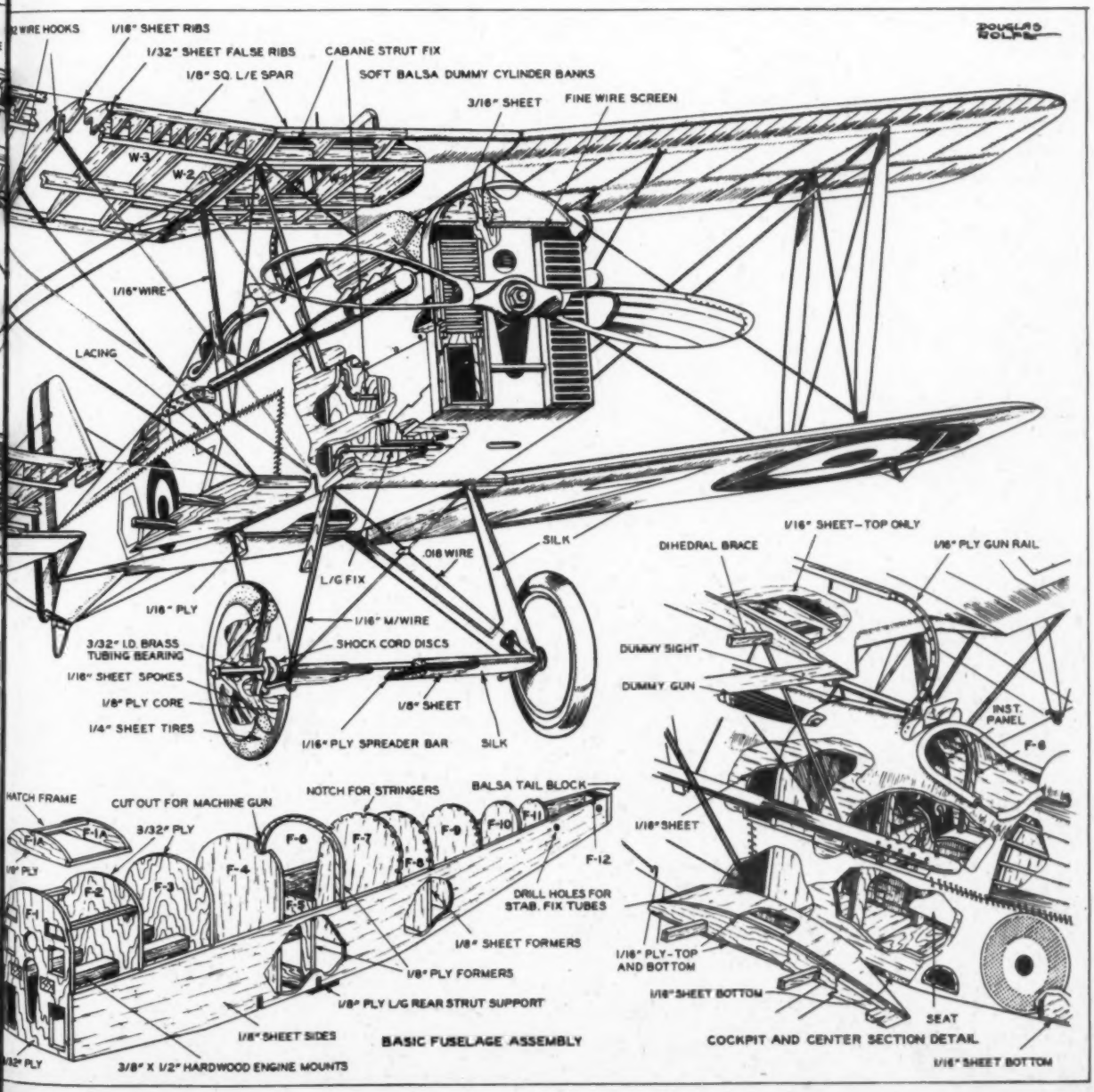
Cover the top of fuselage back to F-7 with 1/16" sheet. This can be done in sections or strips, whichever is easier. Note that, between F-1 and F-2, the sheeting runs up only so far to allow for the removable top hatch. Cement ¼" sq. along the sides of the 1/16" sheet at front for support and to accept 1/16" dia. dowel keys.

Pin the F-1A formers in place and build hatch in place, using ¼" x ¼" strips on sides and ¼" sq. on top; then 1/16" sheet cover and 1/16" dia. dowel keys. Add ¼" I.D. aluminum tubing to rear of fuselage for stab. Cement 1/16" x 1/8" hard balsa stringers on turtle back from F-7. The headrest may be added if desired or left off. Either way is correct since some machines had them and some did not.

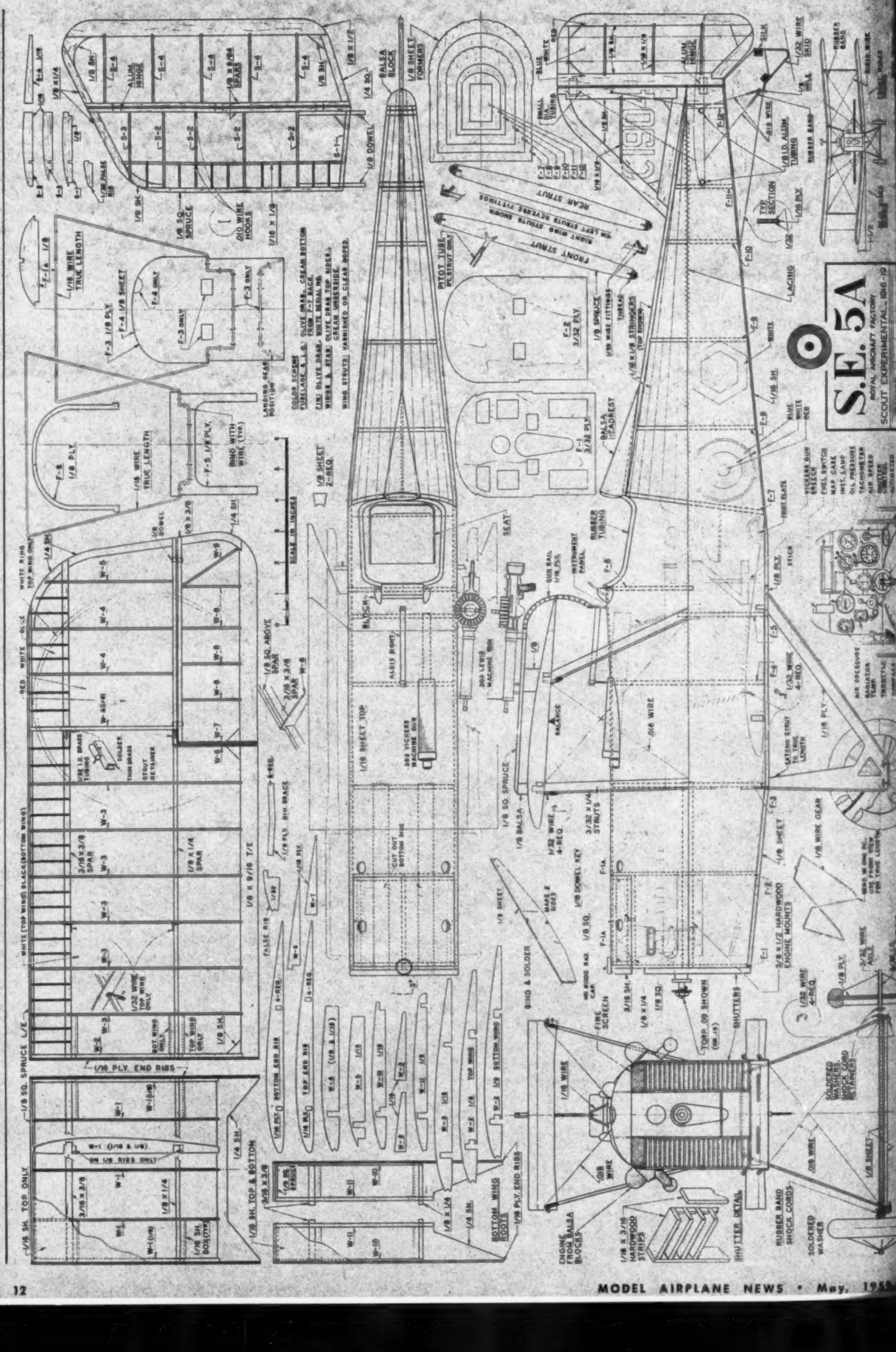
Make cut out for engine exhaust stack. Make an exhaust extension out of tin-can stock or aluminum; this will keep inside from getting oil soaked. Cement 3/16" sheet radiator top into place. Fine window screen can be used to simulate the radiator core. Cover entire fuselage with silk.

Make L.G. struts one piece out of 1/16" plywood and fit between wire, cement, and wrap with silk. Bend 1/32" fuselage rigging hooks and cement firmly in place. Cement 1/16" ply spreader bar core into slots on struts. Make the four wire hooks and cement them and the ¼" sheet pcs. in place. Sand to shape. (*Continued on page* 54)

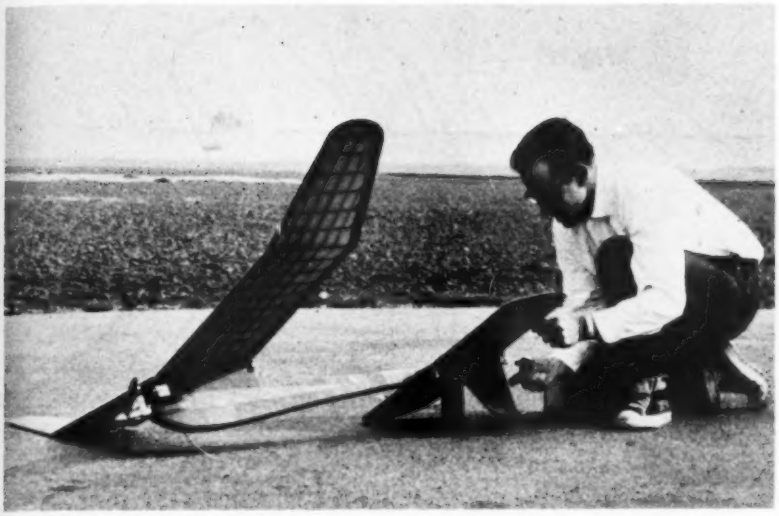
Full Size Plan on Next Page

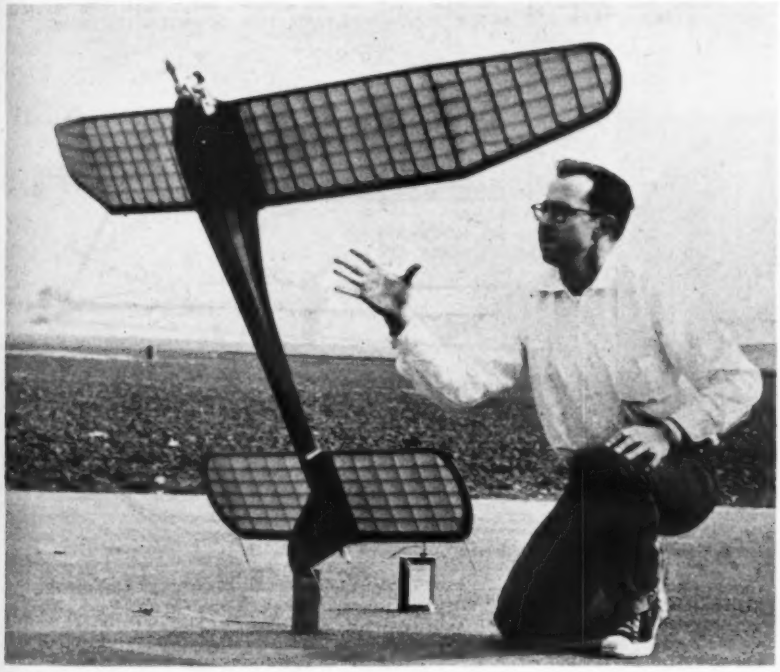


FULL SIZE PLANS AVAILABLE. SEE PAGE 60.



ROYAL AIRCRAFT FACTORY
SCOUT EXPERIMENTAL... 1914-19





Phil Kraft lights fuse on his famous Upstart before he starts the engine, top; and, bottom, releases ship for a VTO take-off. Fuse-type dethermalizers should always use a "snuffer" tube.

Pop It!

by GERALD R. ZEIGENFUSE

Modelers have a "re-entry" problem, too! It is to get down or "dethermalize" the high flying free flight. "Pop up" tail is most effective dethermalizer. Here's the dope.

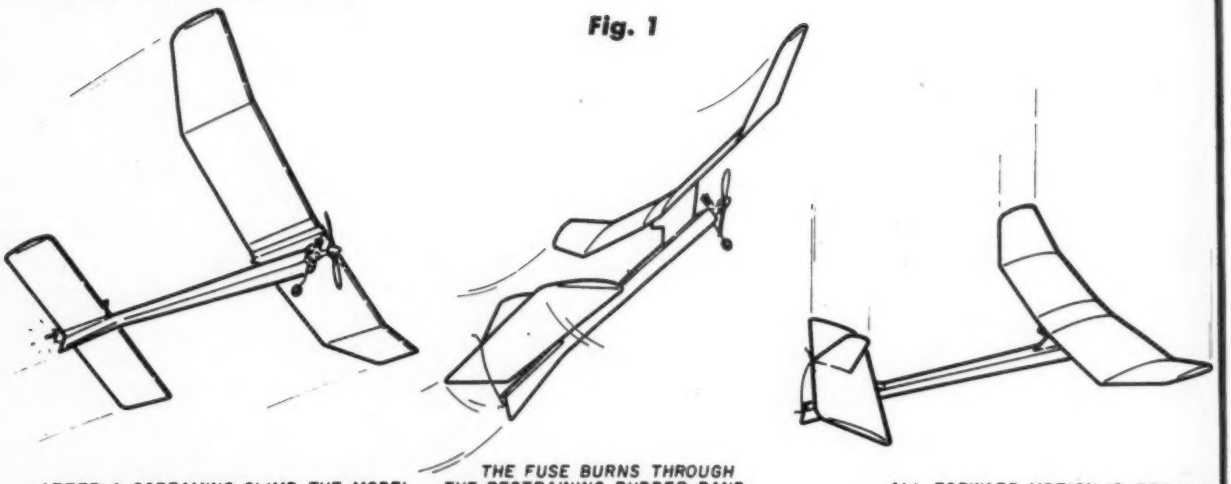
► The exact date isn't recorded in model history, but ever since the first dethermalizer was invented ingenious modelers have been trying all sorts of gadgets with but one purpose in mind. And that is to bring that wandering free flight down out of a thermal so that it may fly again. Also, in these days of higher flying models and shrinking flying fields and flight time limits, it is imperative that the contest modeler use a dethermalizer to insure that he can make the required number of flights without losing his plane in the process.

In the past, devices have been employed to spin the plane out of a thermal. A sure fire dethermalizer but the speed at which the model strikes the ground sort of prohibits its use. Other devices employed were parachutes, pop-up tails, pop-up wings, pop-apart fuselages, split rudders, and spoilers in the wing. We once read where Jim Walker dethermalized an A J Hornet with a firecracker. It does work. But we don't recommend it as we feel that there are some problems yet to be worked out.

In this article, we will attempt to answer the requests of all those modelers who have written this magazine for information on dethermalizers. We will discuss how you may install and use the one type of dethermalizer which has emerged as the most popular and most widely used, the pop-up stabilizer dethermalizer. There are many versions of this dethermalizer and we have shown here the ones most used by contest modelers. You can combine the features of any one of them to suit your individual needs.

The action of a pop-up stabilizer dethermalizer is explained by the sketches in Fig. 1. It is a pretty sight to see your model follow the action of these sketches and break out of a thermal, which would surely carry it many miles away, and descend quickly to the ground almost at your feet. The model descends rapidly, but not too rapidly so that it would be damaged on landing. The rate of descent is controlled by the angle of the stabilizer in the dethermalized position and also the wing loading of the plane. The fellows that added weight to their old FAI gassies to make them meet the new rules will attest to this fact. Some of these ships with the stabs popped to the same angle as when they were lighter, descended so fast that the wings broke in the center on touchdown. On the other hand, a light weight ⅛ A gassie will descend so slowly that it will still be carried away by a thermal if the stab isn't popped up to a very high angle. The proper angle for your particular ship (*Continued on next page*)

Fig. 1

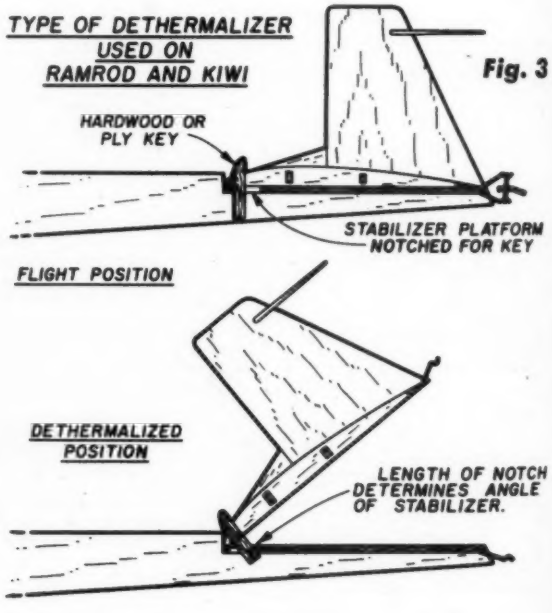


AFTER A SCREAMING CLIMB, THE MODEL CIRCLES HIGH OVERHEAD IN A THERMAL. IT SOARS HIGHER AND HIGHER UNTIL·····

THE FUSE BURNS THROUGH THE RESTRAINING RUBBER BAND ALLOWING THE STABILIZER TO POP UP TO A PREDETERMINED ANGLE.

ALL FORWARD MOTION IS BROUGHT TO AN ABRUPT HALT AND THE MODEL PARACHUTES DOWN ON ITS WING.

Typical "pop up" tail, this case a stabilizer, with fixed rudder. Proper action brings ship down steeply but with nose up, steady. No turns.

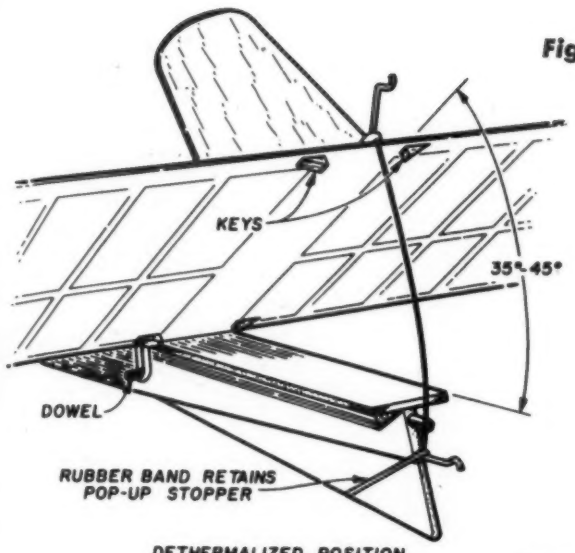


can only be found by experimentation, but here are some figures to use as a guide. For most models flown in competition today an angle of 40°—45° is best. For that 5 oz. gassie that has a 300 sq. inch wing the angle must be 50°—55°. And that heavy FAI gassie should be limited to about a 35° angle.

The most common pop-up stabilizer dethermalizer used today is illustrated in Fig. 2. It is nothing more than the standard method of holding down the tail assembly with an extra hook added to the stabilizer and a limit string or wire. Sometimes a pivot block must also be added. To hold the trailing edge of the stabilizer down, a small rubber band is wrapped several times around the hook on the stabilizer and the hook on the fuselage. A slow burning fuse is employed to sever the rubber band allowing the tail to pop-up. The length of the limit string or wire determines how far the tail will pop up. On any free-flight model the tail assembly must be fastened in such a manner so that it won't shift in flight, and once removed it must be able to be put back in place in exactly the same position as before. We use small keys cemented to the stabilizer to prevent the tail from shifting as shown in Fig. 2. Keys should not be added just because a pop-up tail is being used; they should have been cemented to the stab in the first place. Many free-flight maladies can be traced to the lack of keys or poorly fitting keys. We usually cut small triangular pieces from a hard balsa strip and cement them to the stab.

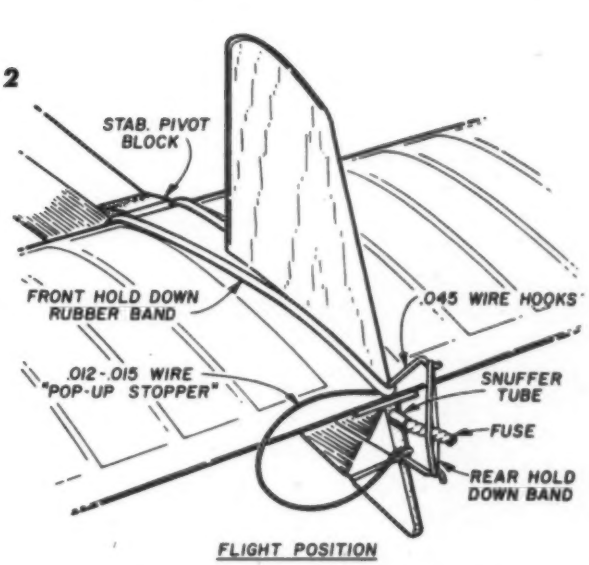
One reason for failure of the above mentioned dethermalizer is the fuse snuffing out and not burning through the rubber band. Care in handling the fuse will prevent most of the failures. Allowing the fuse to become oil soaked from handling with oily hands is one cause of failure and poor protection (*Continued on page 58*)

Fig. 2



DETHERMALIZED POSITION

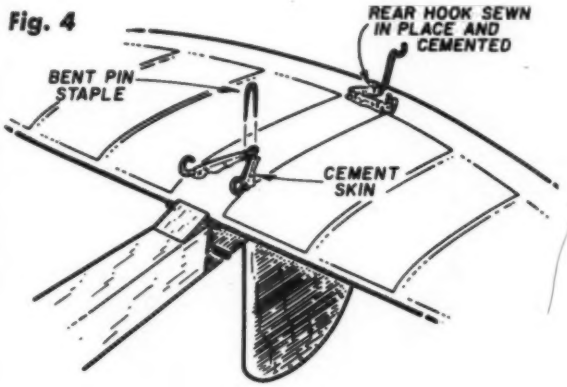
G.R.Z.



FLIGHT POSITION

POP-UP STABILIZER DETHERMALIZER

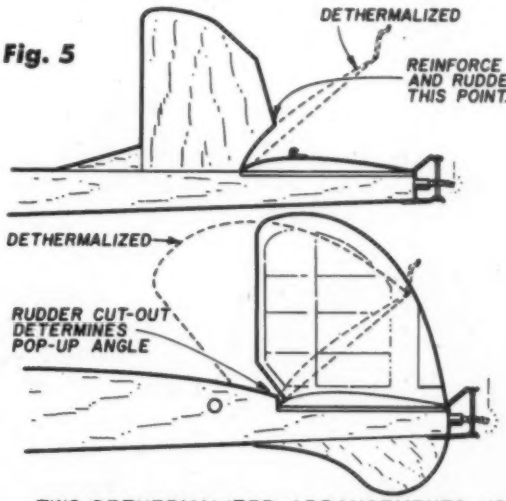
Fig. 4



DETHERMALIZER ARRANGEMENT USED ON INVERTED RUDDER TAIL ASSEMBLY

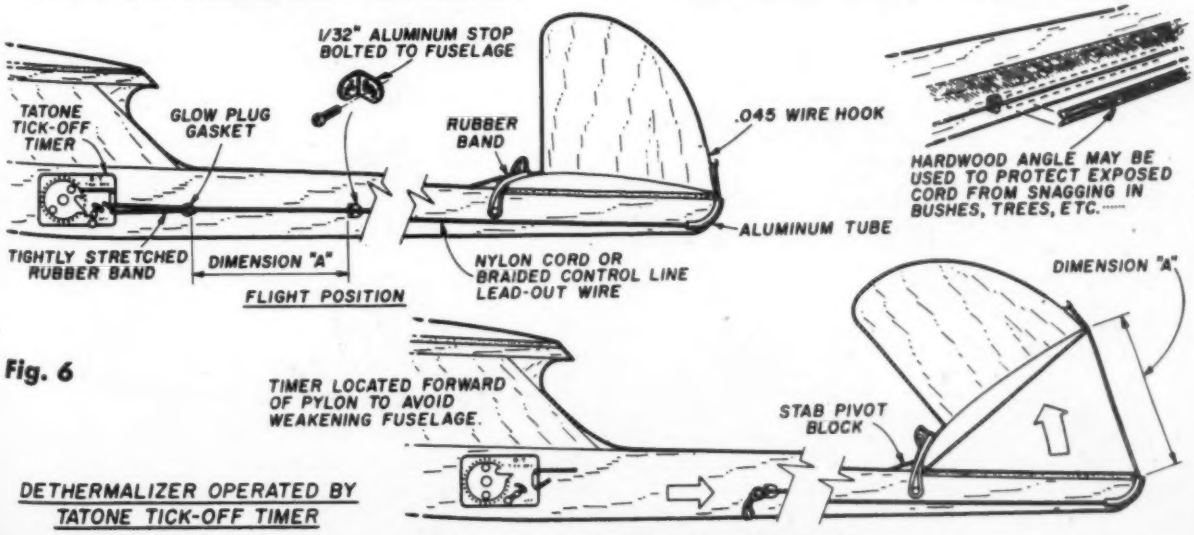
(ALSO USED ON FORWARD RUDDER TAIL ASSEMBLY)

Fig. 5



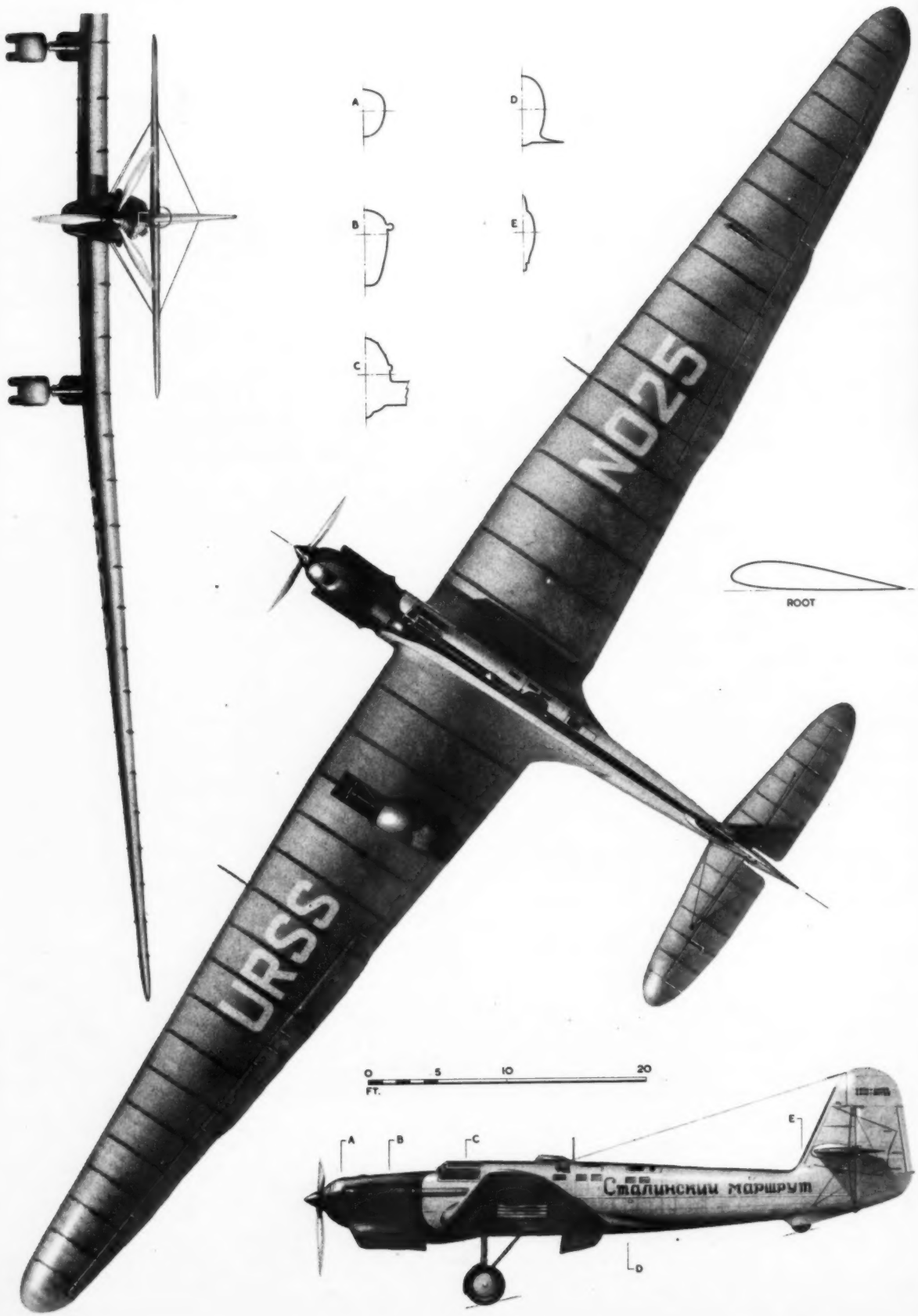
TWO DETHERMALIZER ARRANGEMENTS USING RUDDER TO LIMIT STABILIZER ANGLE

Fig. 6



DETHERMALIZER OPERATED BY TATONE TICK-OFF TIMER

DETHERMALIZED POSITION


A
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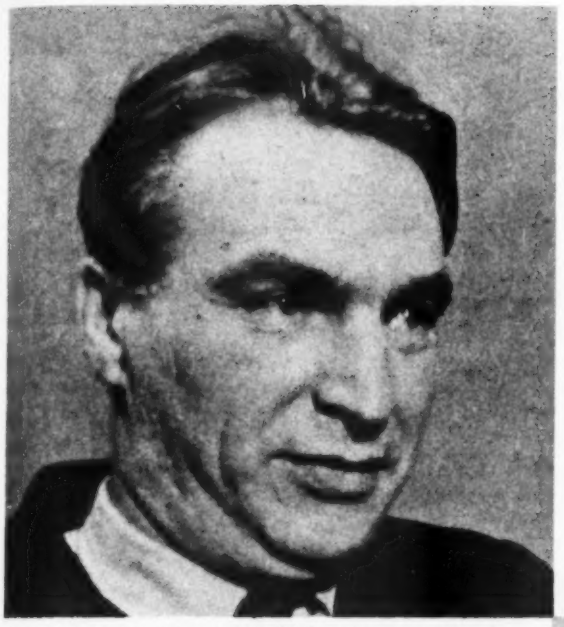
Сталинский маршрут

men and ships



Hero of the Soviet Union, Valeri Chkalov, the commander of the ANT-25 flight from Moscow to Vancouver, Washington.

In 1937 Russian aviators Gromov and Chkalov commanded ANT-25 flights from Moscow to the U.S.

by ROY CROSS

► Biggest-spanned and heaviest of several special long-range record monoplanes built by various countries in the late twenties and the thirties, was the Russian ANT-25.

Conceived in 1932, when Russell Boardman and John Polando held the 5011.8-mile New York-Constantinople record in their Bellanca "Cape Cod", the ANT-25 did not finally achieve success until 1937, but in the meantime several interesting flights were undertaken.

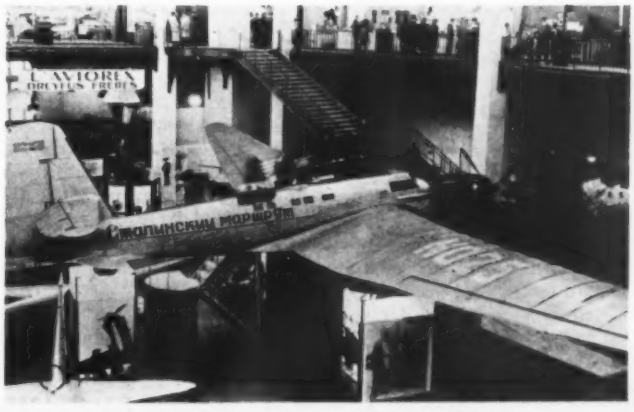
In September 1934 as an initial test of the plane, the famous Russian flier Gromov with crew members Filin and Spirin made a closed-circuit flight reported at 5700 miles, but failed to beat the existing record.

Levanevsky, in a 1935 Moscow-San Francisco attempt, had to land in Siberia with an oil leak after a 3730-mile flight.

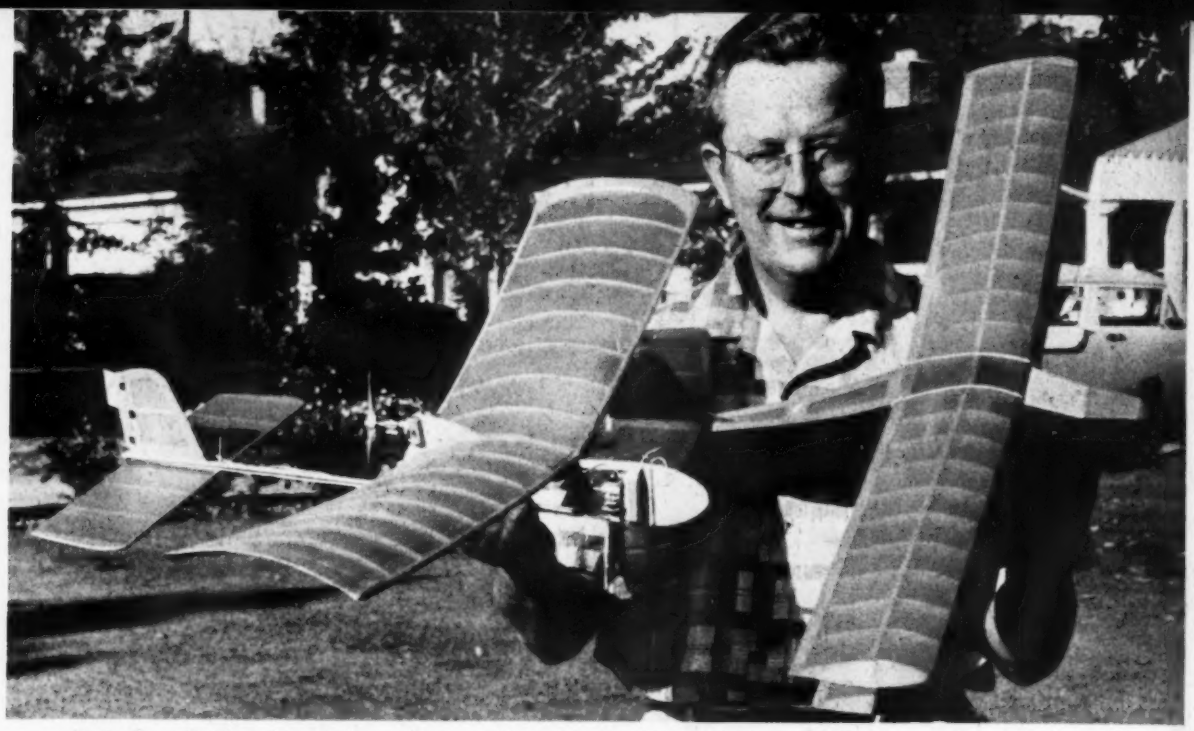
Then, in July 1936, Valeri Chkalov, Alexander Beliakov, and George Biadukov made a long distance flight over the unexplored regions of the Soviet Arctic along what was termed the Stalin Route. Stalin took a great interest in the development of the ANT-25. He saw in it a symbol of prestige for the growing Soviet aircraft industry, and as a propaganda weapon—should it be successful—of the "peaceful" Communist expansionist doctrine.

The 1936 flight was non-stop from Moscow to the mouth of the Amur River, near Nikolayevsk—via Franz Josef Land, (*Continued on page* 42)

Hero of the Soviet Union, M. N. Gromov, S. A. Daniline, and A. B. Youmachev, Moscow, San Jacinto, Calif. *Flight* photo.



On display in the Paris Salon 1936, the huge-winged ANT was a center of interest. Plane held world's distance record.



Having flown the Channel to Catalina, and set a world duration record, Ken—with Warpy and Slo'poke, now flies within four walls!

Indoor R.C.

by KEN WILLARD

Split-levels on the old flying field? Always a gym or a hall—if you build 'em light, fly 'em slow!

► With flying sites becoming more and more scarce in metropolitan areas, the idea of an indoor radio-controlled model has a lot of appeal. There are plenty of auditoriums and arenas, with basketball courts or other flat surfaces, in all cities, and by making the proper arrangements, these would be excellent places to fly small radio-controlled models—that is, if you could make an R/C job which could fly safely within the space available.

Up until recently, the idea was pretty far fetched; then along came the transistor, with its light weight and low-drain features, and suddenly the lightweight radio was an actuality. Sure, there are still some kinks to be worked out, but the sets which are already available are reliable enough and light enough to do some experimenting.

Actually, the indoor R/C job is nothing but a refinement of the small-field R/C model. I have been designing them for quite some time, starting with the little "Breezy" biplane which appeared in MAN a few years back (not to be confused with the commercially produced "Breezy" monoplane which came out a little later). The biplane has the basic characteristics of high maneuverability combined with the chance to get a low wing loading and a fairly small model. Therefore, it was logical that my first attempt at an indoor job would be a biplane.

Since the small field "Breezy" was designed, several new light-weight radios have appeared. So far, the lightest of the lot is CG's all transistorized receiver which even uses a power transistor in lieu of a relay. Also, it operates on three volts, and the small wafer cells which CG puts out are ample power. The limiting factor on this receiver is that it is designed with the Bonner SN escapement in the circuit, and if you use another escapement, your chances of success are marginal, because the magnetic efficiency and operating characteristics of the Bonner are different. However, this limitation is not serious, since the Bonner SN is very reliable; the trouble that I have with it is not the escapement—it's my own inability to remember what's coming up. I finally had to give up and go to the Bonner compound—which uses the same coil, but is bigger and heavier. I saved some weight by cutting it down to a minimum size, and it has proven very successful in the indoor biplane. Another thing you have to do—and maybe CG wishes you wouldn't—is to void the guarantee on CG's receiver by taking it out of the case and using only the chassis. But light weight is paramount, and you can't afford to carry a case around.

So much for the radio. CG's is the lightest commercially available one as of this writing, so that's the one that I am using. Maybe you can build one lighter; if so, good.

As for the engine, I tried several ideas. First was a rubber band motor. I gave it up because the motor run is too short. Next I tried an old Campus "B" CO_2 motor, but it didn't have enough poop. I finally settled on Cox's Pee-Wee .020. It is far too powerful,

but you can convert the power into just the right amount of thrust by making a small metal prop to fit behind the regular prop, but bend it into reverse thrust—just enough to cut the total forward thrust into just what you want. But watch out for your fingers!

Now we've settled on a radio and an engine. What about the airplane? It should not only be light and maneuverable, it should also fly very slowly, both for ease of control in a limited space, and to keep damage down when you goof on the controls, which you will.

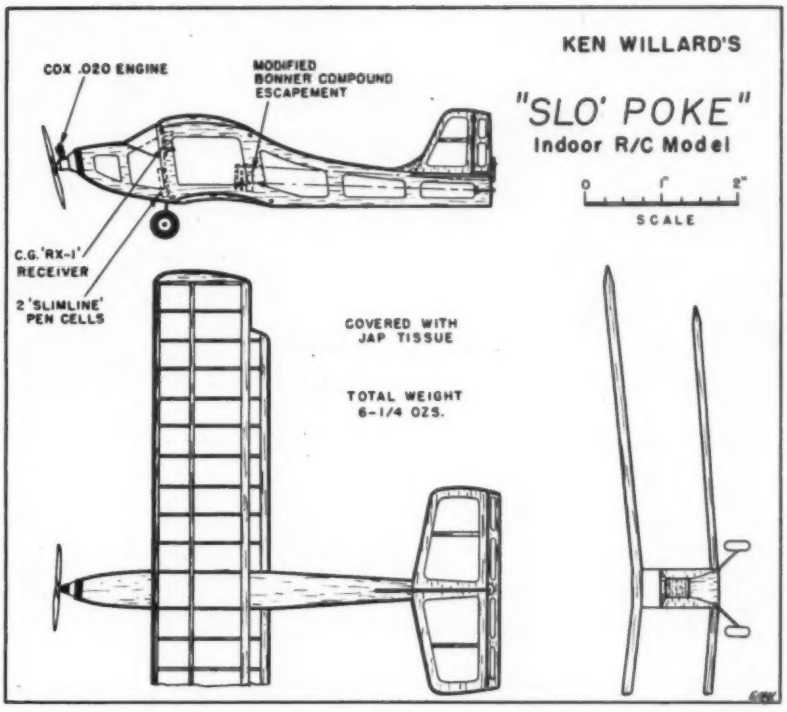
Two factors in wing design help to keep flying speed at a minimum; one is high aspect ratio, the other is high camber. The former has the drawback of reducing maneuverability so a compromise is necessary. But high undercamber has no drawbacks except perhaps a bad stall characteristic—and we can live with that. Generous dihedral is required so you can rock the model around in tight turns.

To fly at the minimum speed, a high angle of attack is required. This is achieved by using lots of downthrust on the motor together with a pretty high angular difference between the wing and the tail. With this arrangement, the engine drags the plane through the air at a speed just above the stall speed associated with the high angle of attack. In fact, when the engine cuts, the plane picks up a little speed! This is because the glide is achieved at a slightly lower angle of attack.

From all the foregoing considerations, a variation of the "Breezy" biplane was designed. To keep weight down, a long narrow fuselage seemed logical, with the top wing up on cabane struts. The aspect ratio of the wings was increased, and the result was a long, thin biplane. This model flew fine—but it was too fast!

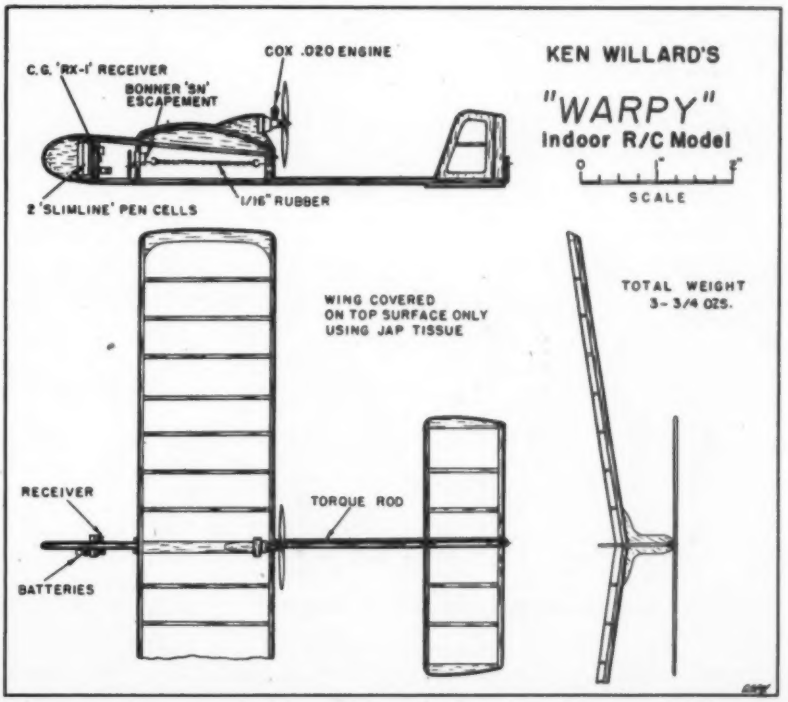
The next design went back to the cabin type fuselage, because of the higher frontal area and bigger drag. I used the same wings and tail, and found a definite improvement. This design, with a 33" wing span, weighed in at six ounces, and is still flying. However, it requires an area about 100 feet by 125 feet for safe maneuvering, and this is still a little large.

While flying the little bipe, which Bob Bowen, editor of the Lark newsletter, christened the Slo'poke, I had another idea for a design which held promise. In the first place the Slo'poke had the prop out in front, which is a bit of a hazard to people who might be watching. It also had a landing gear, which added weight. How about a new concept—from an old one, of course—with the prop in back and a skid to land on? I had also discovered that the Bipe is (*Continued on page* 51)



SLO' POKE: With a 33 in. span, 6-oz. bipe requires an area of 125 x 100 feet for maneuvering. Large dihedral allows rocking turns; a large angular difference between wing, tail, in conjunction with large downthrust, gives a slow flight trim. High undercamber required.

WARPY: Single-surface wing, rudimentary fuselage, for weight of only 3¼ oz. Flies in 30-foot circles and pusher prop more friendly to spectators! Flight is so slow you can run alongside model. But be sure you plasticize well the dope used on that tissue covering.



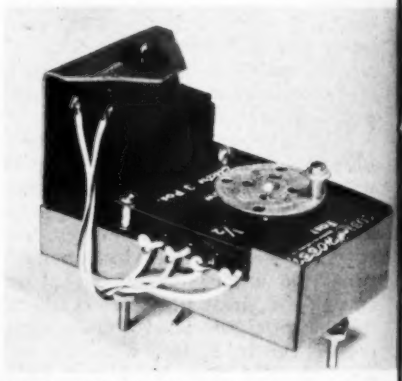
Annual Banquet and trophy presentation of the Baltimore Radio Models Club, true family affair with the wives and "juniors" enjoying the fun. Photog Phillip McShane got a unanimous smile.

Citizen-ship x-mitter "for all 27mc frequencies" has switch selection, left, for tone or carrier.

radio control news

by EDWARD J. LORENZ

Interference Insurance—the "Superhets!" • Carded cues and electronic brains • Weather flights • Duration • Club News and new crates • Trade items and products.



Dept. tests Cobb Hobby motorized escapement—over 14,000 ops, no failure, on two Silvercels.

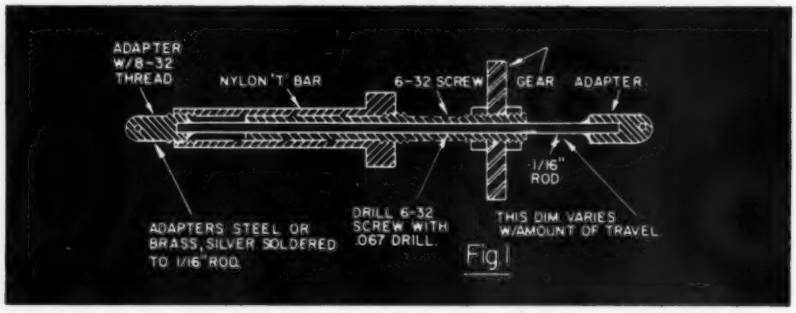


Fig 1

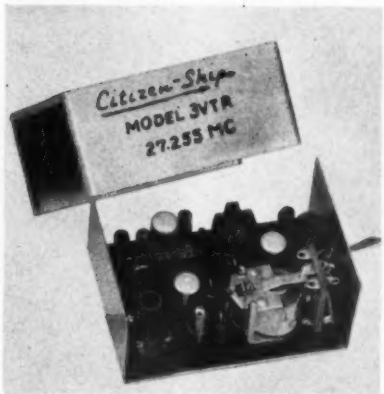
Semi-scale P-51, Clarence Buerggmann, Norfolk, Neb., modified PT-19 wing. Citizen-ship 8, Bonner servos flight controls, Babcock servo for motor control. Gross weight is about seven lbs.

► To say that MAN is not widely read is an understatement. This regards the statement in the February issue about the toxic effects of Teflon. As stated, the information came from the DCRC Newsletter who in turn quoted a statement from the BuAer (Navy). Our mention came to the attention of the E. I. duPont de Nemours and Company, developers of Teflon. We now attempt to clear up what is apparently an unfounded rumor.

Hdq. of the Air Material Command, USAF, made a statement that this rumor is completely without factual basis. Du Pont states there have been *no permanent injuries or deaths* in the use of Teflon during the past 20 years by Du Pont personnel, hundreds of processors, and thousands of end-users.

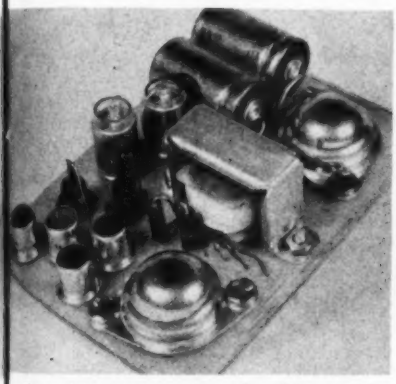
When Teflon is heated in the 400-600 degree F range, *minute* quantities of decomposition products are evolved. If these are inhaled, you may get temporary symptoms similar to grippe or influenza. Symptoms appear about two to six hours after exposure and pass off within 36-48 hours. However, the main point is, they are not cumulative. In other words your body completely throws off any temporary toxic effect, which is more than can be said

King Kong, the LA traffic light monster, and relatives elsewhere, won't bother the "superhets."

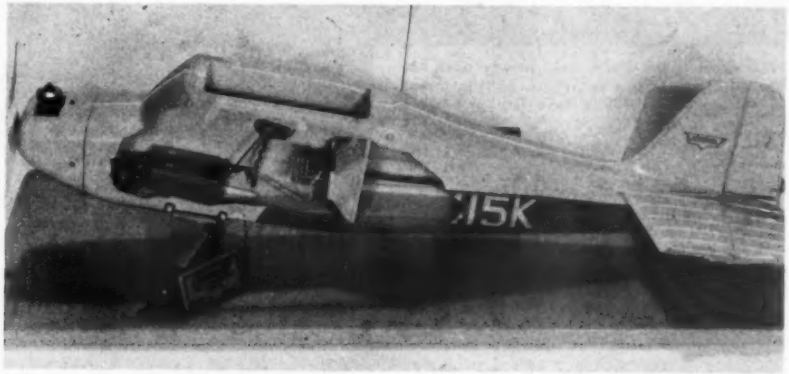


Relay, Citizen-ship 3VTR, can be removed, if so desired because of high current change possible.

Additions to top of Citizen-ship 8 show what is involved in achieving "superhet." Fly formation?



Transmitter power converter by Al Diem, under 4 in., 4 ozs. WAG, Orbit, CG, etc. It is tops.



Cutaway view of new Babcock Aeronca plastic job showing installation of the Magic Carpet Mk 2 receiver. No time to build is no longer a valid excuse not to fly! Note knock-off landing gear.

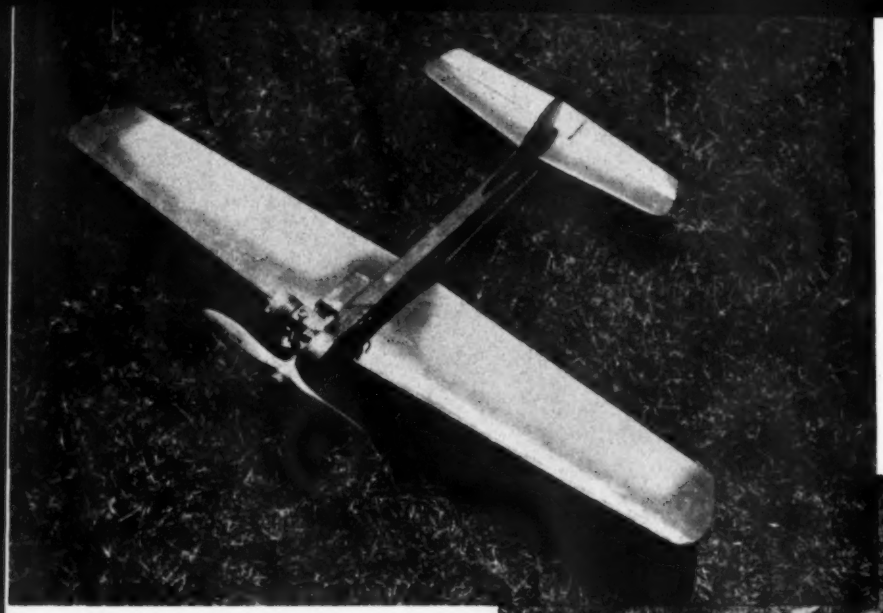
of the lead contained in solder. Various other insulations and resins can be considered far more toxic and some household materials which are used everyday can be far more harmful. Teflon can be taken internally or worn in close contact to the skin with no ill effects. It is one of the most stable materials known. The statement given in the February issue was made as a matter of information and has had wide circulation in industry. We felt it was better to play safe. Sincere thanks is given to the Du Pont Company and to the Air Material Command, USAF in clearing up this matter. We still say that Teflon spaghetti is unsurpassed for RC work.

About a year or so ago we predicted that radio-controlled model aircraft, as designed and built by the average RC builder, might be used for meteorlogical purposes, especially with regard to determining upper level radiation, temperature, etc. Henry Stuck has done just that, having designed a Fox 59 powered, five-channel RC job with a span of about nine feet. Well designed, but rather conventional in appearance, this model is said to have a "homing device" for bringing it in from high altitudes and from a distance.

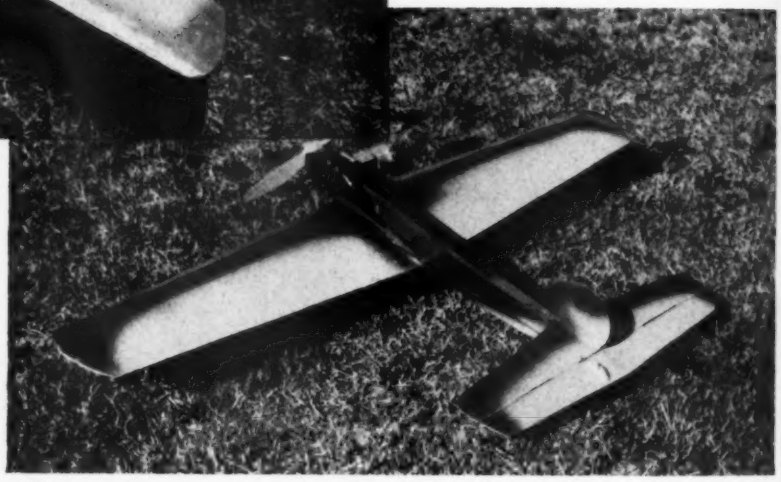
Maj. Tom Mahon, Alexandria, Va., built 70 in., Fox .59 job for dual proportional, using double-geared Mighty Midgets. Flew right off bench, no trim was required. Photograph by Jos. Barnes.

Although we have described some of the new Citizen-ship equipment under New Items, here is a bit more of the technical side. As you know, there is a separation of 50kc between the spot frequencies. This may seem fairly safe; however, there are other frequencies assigned for communications which dictate that a receiver for our use must have a selectivity far greater than 20 to 25 kc. Citizen-ship's equipment is designed for about 5kc selectivity which appears to be adequate and at the same time keeps circuitry to a minimum. Under Club News we mentioned a set being developed having 1 kc selectivity. This is very possible and (*Continued on page* 62)

the pied piper



Functional is the word, bub. Beauty does not go with combat and rat racers. So who cares? These galloping profiles take the .29's - .35's.



Finish? Four coats clear and sanding filler, three coats of base color, one spray-can trim.

High average speed imperative and this means easy service, a good acceleration, stability.

by BILL JUDGE

After a direct hit in his "Woody" combat, your old Wyoming fire-breather has another hot airplane, this time a proved rat racer.

► When Rat Racing was approved by AMA, most of us were agreeably surprised that the rules turned out so well. Chief accomplishment was standardization of the length of heats, and the number of pit stops per heat. Of course, the usual hue and cry went up almost before the rules were given a fair chance. After the smoke had blown away, it was found that with the heats so clearly defined, Rat Racing in medium and small sized contests was one of the few events that paid its own way. As far as the Nationals is concerned, Rat Racing has been the shirt tail relative of its more blue blooded cousin, Team Racing.

(The one place where it would seem that the AMA, had passed up a bet, was that they should have required all sanctioned meets holding Rat Race events, to report on the type of race held and on the method of procedure.)

The rules permit the contest director to stage the type of race best suited to his locality and field of entrants, subject to the race being composed of heats as defined.

Three types of races can be scheduled. If there are many contestants and a minimum of time, a race can be made an elimination contest by holding a series of the shorter dash heats. If there is a small number of contestants, the single final 140-lap heat may be held. Probably the most popular type is to have the qualifiers, or winners of the dash events, go into the 140-lap final.

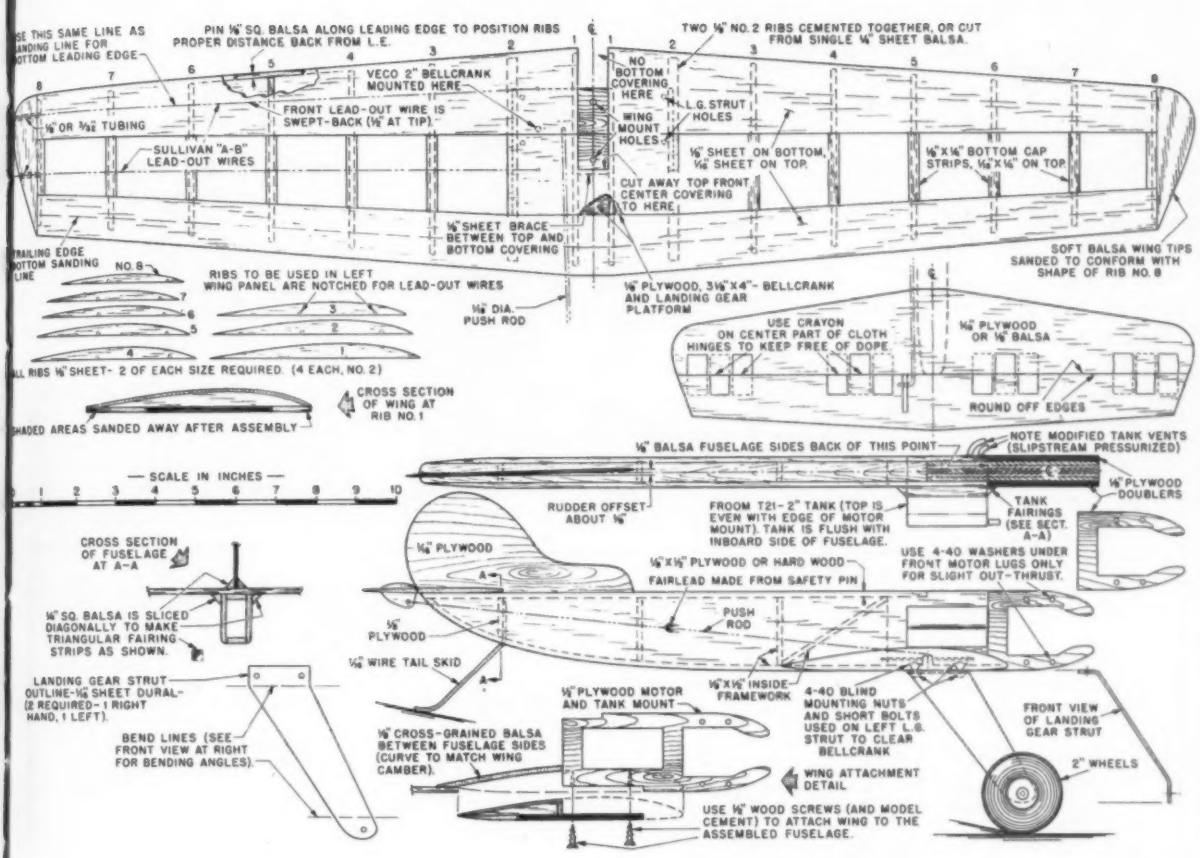
Rat Racing has been responsible for an infusion of new blood in clubs and a rekindling of interest among older members. On club contest days, Rat Racing can absorb the entire personnel of small clubs as fliers, crew members and officials.

In larger clubs, because of space and time problems, interest may be centered in the shorter dash heats. Other

Two-foot take-off, by the yardstick! Just one of the many Wyoming-style bullets shows style!

Fifteen-ounce weight means lower impact—well, now, as well as, jack-rabbit take-off ability.

The hands are connected to Bill but, anyway, a Pylon Brand squeeze bulb good for fast fill.



FULL SIZE PLANS AVAILABLE. SEE PAGE 60.

factors, such as smooth or surfaced flight areas, may lead to concentration on the small speed types of models, with fast motors, hot fuels, racing props, etc. Winners in this type of club contest generally are those few that are well acquainted with speed stuff and take the trouble to build models for this type of race.

If the majority of club members prefer this type of race, there is nothing more to be said. However, the intent of Rat Racing is to give every type of model an equal chance. If the majority of club members prefer to see the laurels passed around, matters can be adjusted within the club. There is no need for special legislation, classification, or discrimination against any type of model.

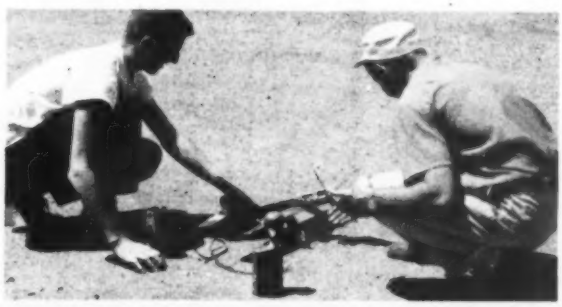
First, there is a popular type of start that is different from the one outlined in the rule book. All models and crew members are located outside the flying circle. With the starting signal, the crew members start motors. Models are then carried in turn to the flying circle and released in the order of the starting of the motors. Lap counts start with the release of the first model.

This type of start gives a handicap to the slower but easier to start motor over the hot but cranky motor. It also prevents giving a crew-cut to green crew members who always seem to run in every direction but the right one.

Second, take-off and landings should be changed from the smooth surfaced area to a rougher one that favors good take-off and landing characteristics of a model plane.

Third, concentration should be made on the longer races with their greater number of required pit stops, take-offs and landings on this rougher terrain.

This type of start, rougher terrain, and increased number of pit stops, are great equalizers. (*Continued on page* 38)

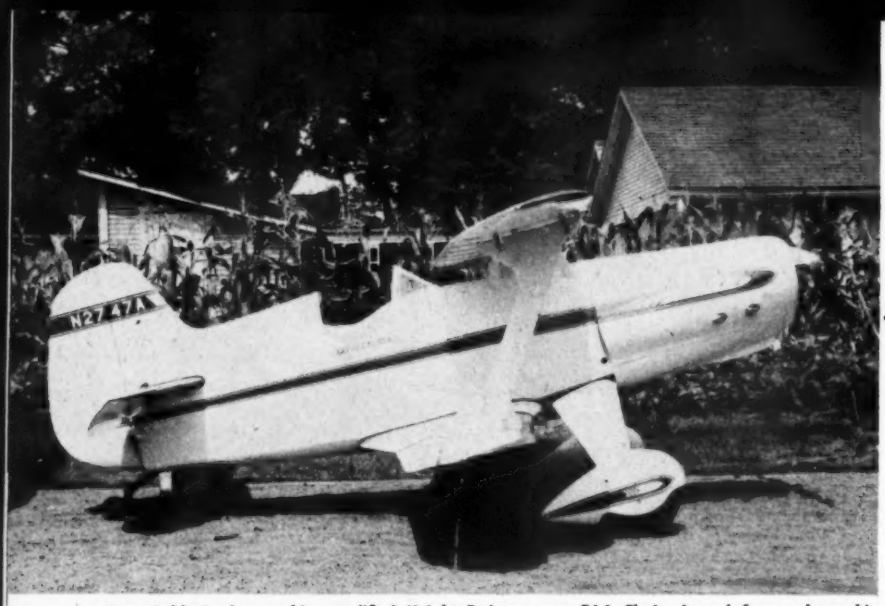


Ground surface, smooth or rough, can be basis of interesting local rules variations, shifting emphasis from speed to dependability.

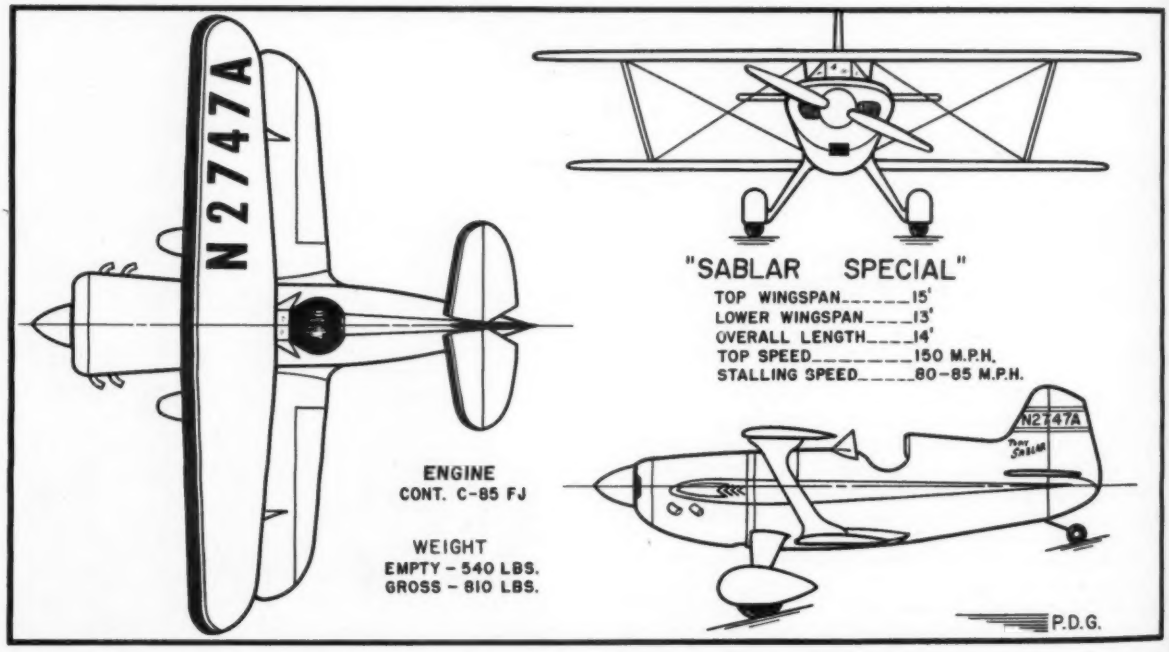
Make these things one, two, three—that's how simplicity pays off. Team racer type landing gears avoid bouncy landings and take-offs.

Home Built Parade

SABLAR SPECIAL



Tony Sablar's dream ship, modified Knight Twister, won EAA Fly-In Award for workmanship.



► The S-Special is nothing more than a big scale model, says its builder Tony Sablar, "except that you are in it instead of flying it on the end of 60-foot lines—and this is something you think of each time you glue or weld something."

Barely old enough to fly models in the thirties, Tony fell in love with the Knight Twister, designed by Vernon Payne, vowed some day to make one. A long time later, and after five years of work, and money, and pep talks from brother Mike, Tony finished his dream ship, but with Continental power instead of the Twister's in-line.

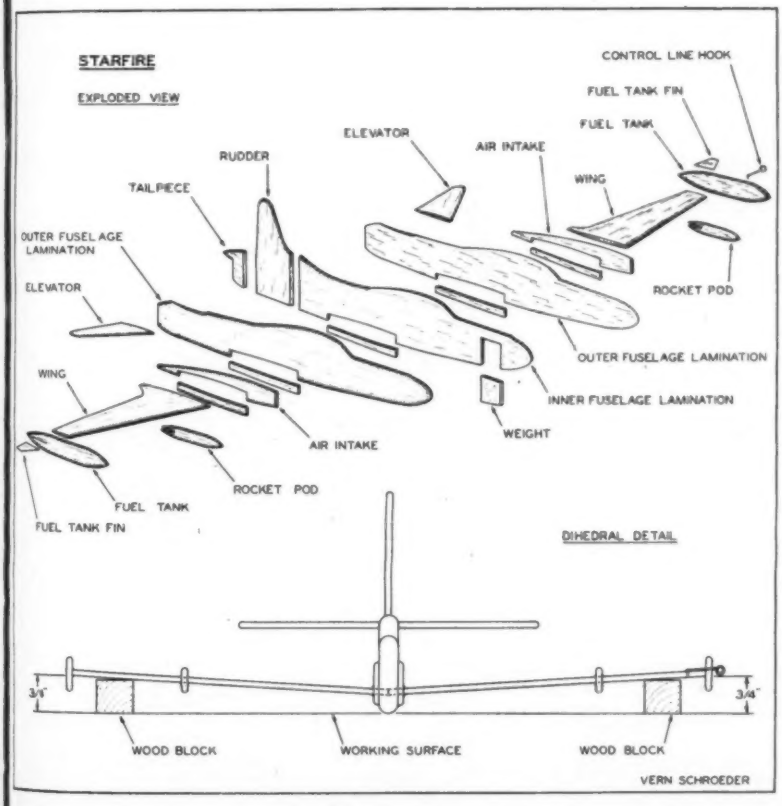
"Since I love a scale model, (*Continued on page* 70)

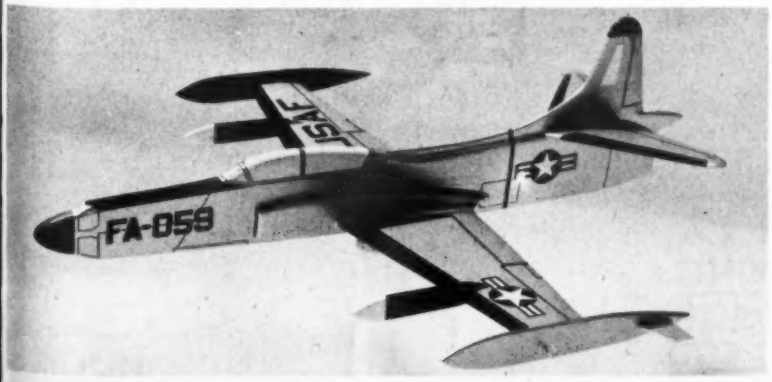
Home-built projects usually prove family affairs. Gals can make one!

Tony, Workmanship Firsts, Bloomington, Ill., ('58); Milwaukee, ('59).

whip-control STARFIRE

Ready for launching, the author shows how the Starfire hangs on its line at the end of a pole. Though the elevator is not movable, ship can be maneuvered by lifting or lowering the pole.





With the help of the exploded drawing above, a nifty craft can be put together, provided you don't get impatient. Be sure to balance model as directed, do read directions before starting.

by VERN SCHROEDER

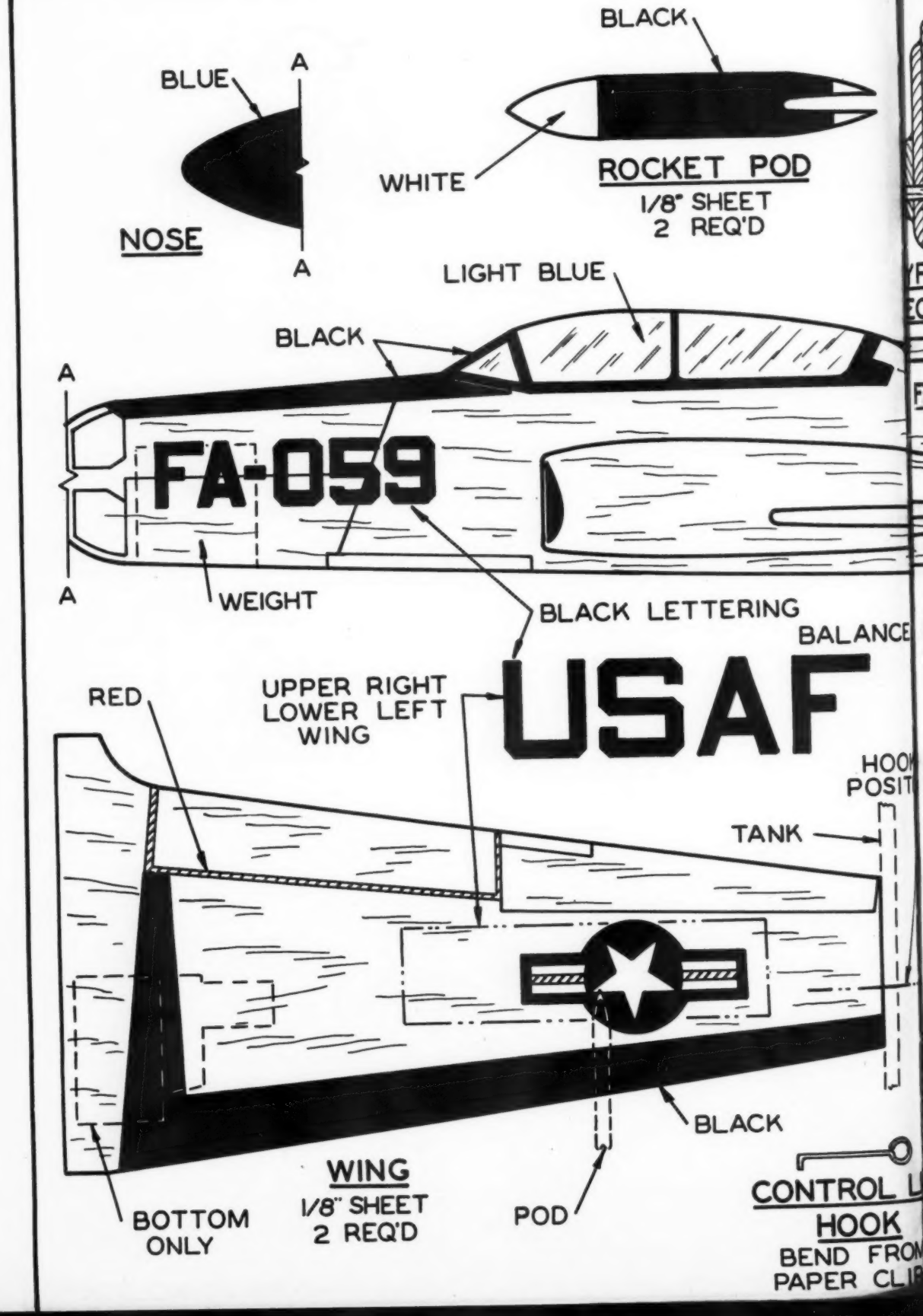
Real looking, it whistles as it flies. Besides the fun, it makes a wonderful preparation for U-control flying.

► Have you ever dreamed of flying one of those super-sleek scale jet jobs? Too much work, too much money, too noisy, you say. Here's one that can be built in a couple of evenings with a minimum of expense and effort. It looks amazingly realistic and sounds just like its big sister as it whistles past the spectators.

The secret of its simplicity is the fact that it is a "whip control" model. The idea is not new, being originated during the war (by Jim Walker) when no motors or rubber were to be had for powering of conventional models. Our model has a fixed elevator, rather than movable, as many whip models have. Though not as maneuverable, it is easier to build and to fly and makes an excellent model for a beginner who is just getting started in the control-line field.

The model presented here is the Lockheed F-94C Starfire, which I am sure needs no introduction, so let's get right down to the construction. The entire ship is built from one ⅛ x 6 x 36" sheet of medium or hard balsa. Trace all the parts onto the ⅛" sheet and cut them out with a sharp knife or razor blade. Note that the grain on the rudder runs opposite to that of the fuselage and there is a slot left in the center fuselage lamination for the addition of ballast. Cement the three fuselage laminations, engine air inlets, and rudder together and when dry, sand them to shape as shown in the fuselage cross section. Sand the wing and tail surfaces to airfoil shape and round off the edges of the fuel tanks and rocket pads. After giving all the (*Continued on page* 50)

FULL SIZE PLANS NEXT TWO PAGES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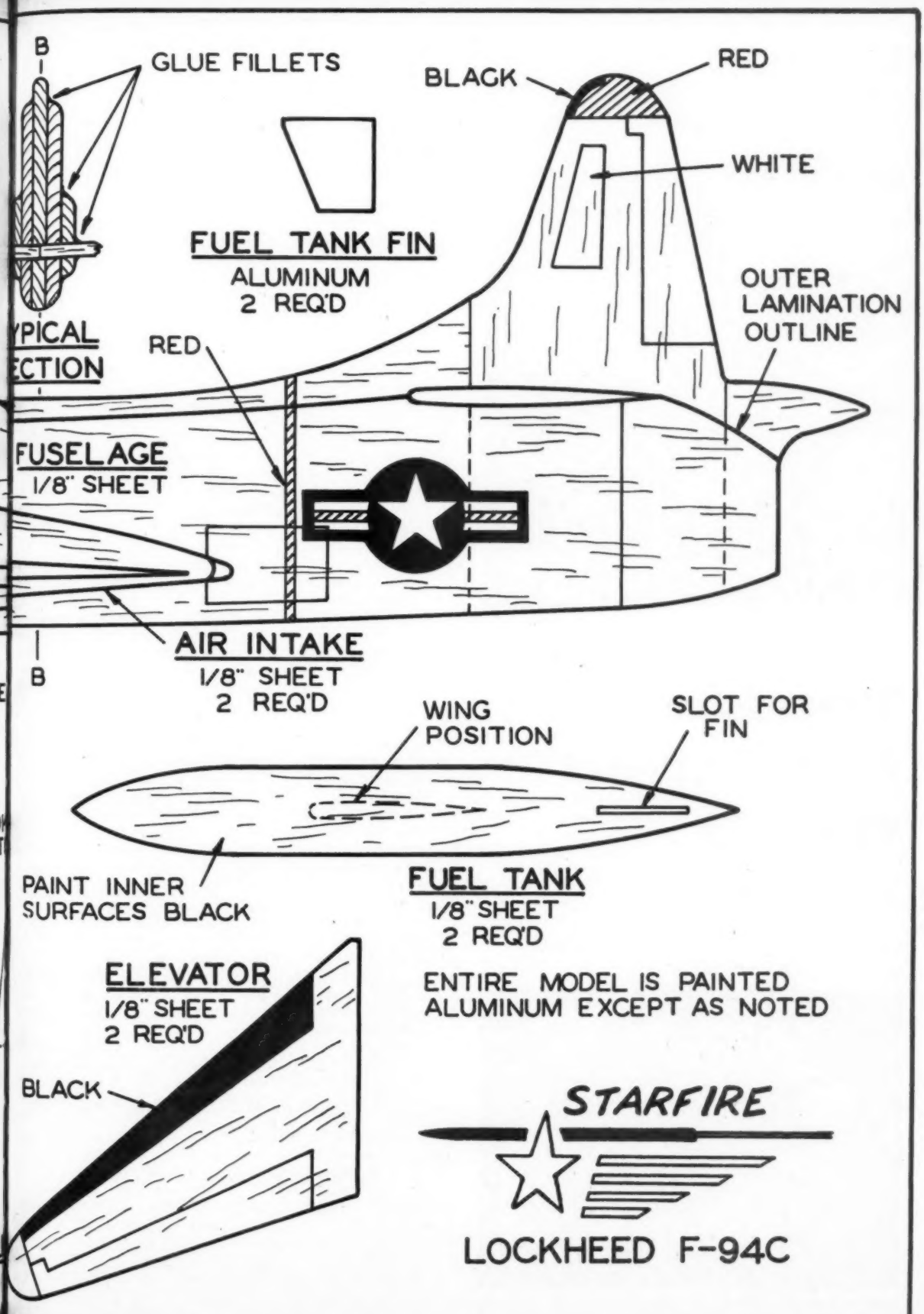
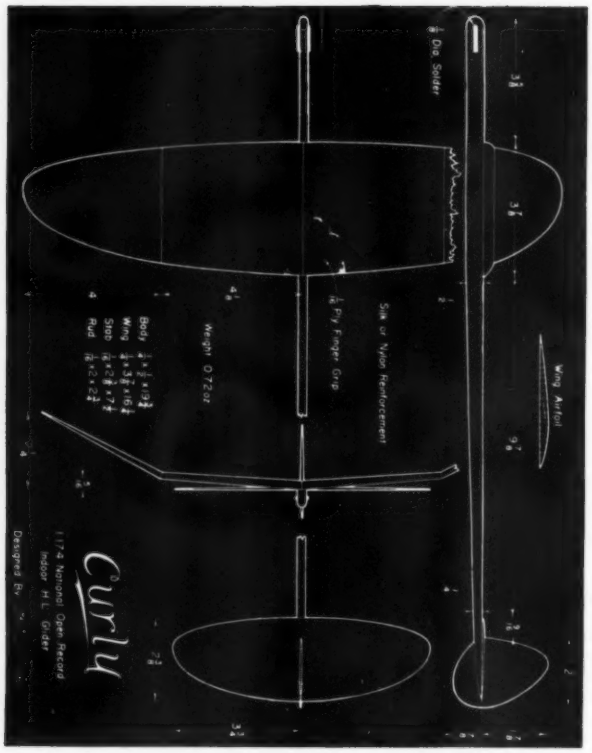
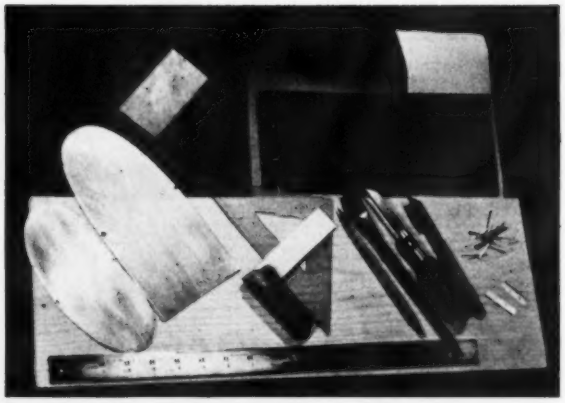


VERN SCHROEDER



The Hand Launched Glider

Part Two



Tools required in building: work board, knife, razor, a square, straight-edge, sandpaper and block, pencil, brushes, templates.

by WILLIAM DUNWOODY

To make a really good glider you have to be as fussy as a French chef. The wood must be just so and workmanship, she must be on the ball. Notes from a champ.

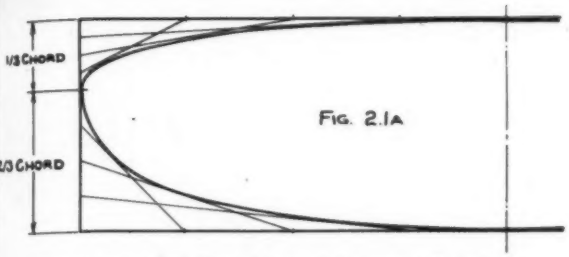
► No doubt those readers who followed the data in Part I and designed their hand-launched glider went on to build one or two and are, therefore, aware of many of the problems of construction involved in these models. This article will present the methods employed by the author in constructing his gliders. Other modelers use different methods, some of which will also be presented. In most cases these differences are merely a matter of personal preference.

Construction of a hand-launched glider is usually begun by laying out the wing and stabilizer planforms on the wood. If the builder desires a shape other than square or tapered, the parabola is probably the easiest to lay out (figure 2.1a). The ellipse is reputedly the ideal planform shape but is more difficult to plot (figure 2.1b). Other methods of plotting elliptical planforms can be found in any drafting text book. A free-hand curve will be quite satisfactory if care is taken to match the left and right halves and if the curve is drawn without any bumps or sharp corners.

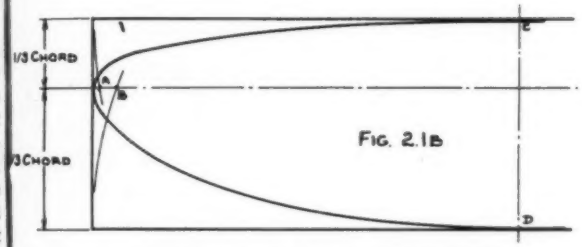
Many modelers make up aluminum, cardboard or plastic templates for their wing and tail surface outlines when they finally arrive at a suitable design. These allow the wing to be cut out accurately without having to match halves and also help to rule out variations from one model to the next, allowing more accurate evaluation of a design over a series of models. Such templates can be seen in figure 2.2.

It is not necessary to have all the tools shown in figure 2.2 in order to build good gliders, but all of them are very helpful if available. Most builders use a plane to rough shape the wing airfoil, although I prefer to carve it with a knife. The razor, sandpaper block, square and straight edge are very necessary. Another helpful tool is a piece of ¼" plywood about 12" x 18" with a metal straight edge set along one side for use as a building board. One modeler I know uses a sheet of plate glass for this purpose. It is important that the board be smooth and flat. Several grades of sandpaper are needed: 2/0 for rough shaping after carving, 6/0 or 8/0 for final shaping and 320 or 400 finishing paper for final finishing and polishing. I prefer to use garnet paper, sand-screen or production paper instead of common sandpaper; these papers are slightly more expensive but last much longer, clog less and give generally better finishes.

The plank of wood selected for use in the wing should be cut about ¼" longer than the wing, the leading edge determined (it should be the harder edge if there is one), and the planform traced onto it leaving ¼" at each tip. Before cutting the wing blank to outline shape, mark the dihedral break lines on the underside of the wing, using the square and the leading edge as a reference edge. Score the lines about 1/32" deep with the razor blade so that the surface may be sandpapered without erasing the lines. The blank is then cut to shape and tapered from root to tip; a straight taper to about one-half the root thickness at the tip is usually about right (see figure 2.3a). Rough sandpaper is best for this job. A line is then drawn on the upper surface of the wing about 1" back from the leading edge on 4" chord wings (⅞" on 3½" chord wings and ¾" on 3" chord wings). (*Continued on page* 34)



PARABOLA: DIVIDE HALF SPAN INTO 4 EQUAL SPACES AT BOTH EDGES. DIVIDE CHORD INTO 1/3 & 2/3 AS SHOWN & SUBDIVIDE THESE SPACES INTO 4 EQUAL SPACES. CONNECT THE POINTS AS SHOWN & DRAW CURVE TANGENT TO INSIDE LINES.



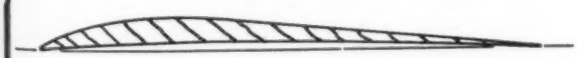
ELLIPSE: DRAW MAJOR AXIS. USING C & D AS CENTERS SWING ARCS OF 1/2 SPAN MARKING POINTS A & B. ON BOTH WING HALVES. PUSH PINS INTO BOTH POINTS A & POINT C. TIE A LOOP OF STRING TIGHTLY AROUND ALL 3 PINS. REMOVE PIN C, PLACE PENCIL INSIDE LOOP AT C AND TRACE CURVE KEEPING STRING TAUT. REPEAT USING POINTS B & D.

FIG. 2.4

A. TRIANGULAR AIRFOIL.

B. CURVED AIRFOIL.

C. BLUNT AIRFOIL.



D. UNDERCAMBERED AIRFOIL.

E. LIFTING STABILIZER AIRFOIL.

F. SYMMETRICAL STAB. AIRFOIL.

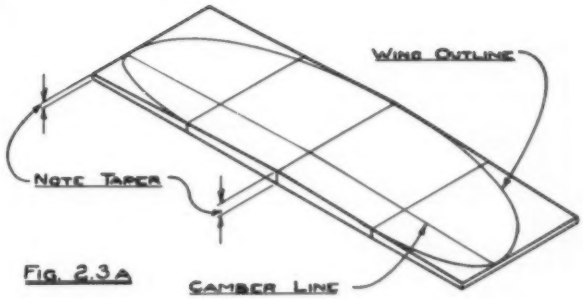


FIG. 2.3A

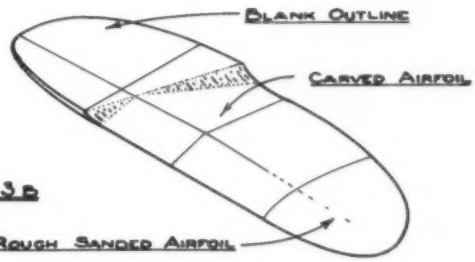


FIG. 2.3B

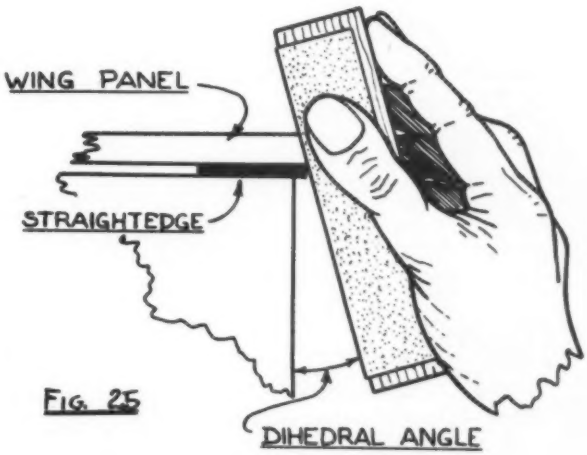


FIG. 25

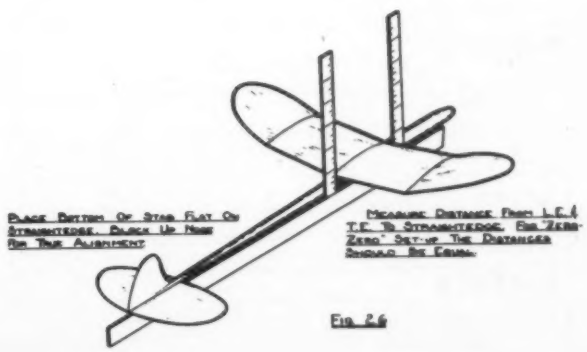


FIG. 26

International Airfoils

After years of flying at European contests, meeting the local experts, the author reports on the better sections.

by JOHN STEWART

► For years the American modeler has depended on a narrow range of airfoils, such as the Clark Y, the NACA 6409, numerous "zip" sections related to convenient French curves, and has been content to knock off his "maxes" without resort to "theory." He has been troubled, though, by grapevine reporting of Benedek, Isaacson, Gottingen and other strange-sounding sections long used in Europe. How good are these foreign sections?

Thanks to John Stewart, MAN is able to present this rundown of worthwhile sections. While on duty with the Air Force in Germany, Stewart entered many contests, met and flew with the famous modelers in Europe. Into a well filled notebook went comments, ordinates, direct observations. The comments below are keyed to the airfoils shown, beginning at the top left, and working down the three vertical columns.

For space reasons, abbreviations sometimes are used. Gottingen is shortened in some references. DAN. stands for Danish, FIN. for Finnish and M.P. for Modellprofil (same as airfoil in English). (The publishers of MAN have no objection to individuals arranging locally for photostatic enlargements for their own model building purposes).

G-359: Good glider (A/2) airfoil. For rough air and strong thermal conditions. Best still-air time about 2:30. Used on Gruner's "SIGI 1." Denzin says a turbulator at about 60% of chord might help. Use similar section in stabilizer. Source: Vladimir Prochazka.

G-428: For FAI power. Should give good climb and rate of sink. Quite stable. Best to plank upper surface to 40% chord to avoid laminar separation. Use 8% thick Clark stabilizer. Source: Vladimir Prochazka.

G-439: A/2 or A/1 airfoil. Should have similar characteristics to the G-359. Somewhat better sink rate but may be difficult to trim in strong winds and/or rough air. Use similar section in stabilizer or NACA 6409. Source: Prochazka.

G-602. For FAI power. Use 8% thick Clark Y in stabilizer. Klaus Hertsch says this section should be good for Wakefield. Source: Prochozka. (*Continued on page 42*)

%	0	1.25	2.5	5	7.5	10	15	20	30	40	50	60	70	80	90	95	100
UPPER	0.8	2.5	3.6	5.3	6.6	7.5	8.8	9.6	10.3	10.0	9.2	7.9	6.3	4.4	2.5	1.5	0.2
LOWER	0.8	0	0	0.2	0.5	0.8	1.3	1.8	2.5	2.7	2.6	2.4	1.9	1.3	0.6	0.3	0.2

G-359 ①

%	0	1.25	2.5	5	7.5	10	15	20	30	40	50	60	70	80	90	95	100
UPPER	1.3	2.8	3.5	4.8	6.1	6.5	7.6	8.2	8.6	8.4	7.8	6.8	5.5	4.2	2.2	1.2	0
LOWER	1.3	0.3	0.2	0.1	0	0	0.1	0.2	0.3	0.4	0.4	0.4	0.3	0.2	0.1	0	0

G-428 ②

%	0	1.25	2.5	5	7.5	10	15	20	30	40	50	60	70	80	90	95	100
UPPER	0.8	2.5	3.4	4.9	5.9	6.8	8.1	9.0	9.6	9.4	8.7	7.5	6.0	4.2	2.3	1.2	0
LOWER	0.8	0.2	0.1	0.1	0.2	0.4	0.9	1.2	1.7	2.0	2.1	2.0	1.6	1.1	0.6	0.4	0

G-439 ③

%	0	1.25	2.5	5	7.5	10	15	20	30	40	50	60	70	80	90	95	100
UPPER	2.5	4.1	4.9	6.2	7.1	7.8	8.8	9.5	10.0	9.8	9.1	8.0	6.6	4.8	2.6	1.4	0
LOWER	2.5	1.5	1.2	0.8	0.5	0.4	0.2	0.1	0.1	0.2	0.3	0.4	0.5	0.4	0.3	0.2	0

G-602 ④

%	0	1.25	2.5	5	7.5	10	15	20	30	40	50	60	70	80	90	95	100
UPPER	1.2	2.8	3.5	4.6	5.4	6.0	7.0	7.7	8.6	8.8	8.4	7.5	6.2	4.5	2.5	1.3	0
LOWER	1.2	0.4	0.2	0	0	0.1	0.5	0.9	1.7	2.4	2.8	3.0	2.8	2.2	1.2	0.7	0

GOTTINGEN 495 ⑤

%	0	1.25	2.5	5	7.5	10	15	20	30	40	50	60	70	80	90	100
UPPER	0.7	2.2	3.2	4.8	6.0	6.9	8.1	8.8	9.2	8.8	7.9	6.6	5.1	3.6	1.9	0.3
LOWER	0.7	0	0.2	0.6	1.0	1.4	2.2	2.8	3.3	3.5	3.3	2.9	2.3	1.7	0.9	0

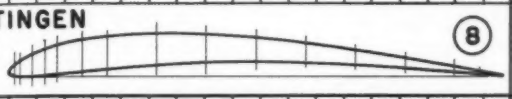
B-6306B ⑥

%	0	1.25	2.5	5	7.5	10	15	20	30	40	50	60	70	80	90	100
UPPER	1.2	3.0	4.1	5.8	7.1	8.0	9.2	10.0	10.4	9.9	8.9	7.5	5.9	4.2	2.3	0.3
LOWER	1.2	0.2	0	0.1	0.3	0.5	1.2	1.9	2.7	3.1	3.0	2.7	2.2	1.6	0.9	0

B-8306B ⑦

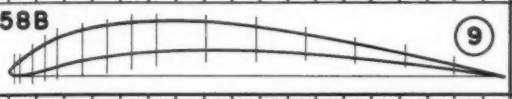
%	0	1.25	2.5	5	7.5	10	15	20	30	40	50	60	70	80	90	95	100
UPPER	0.6	2.6	3.5	4.7	5.5	6.4	7.5	8.2	8.7	8.5	7.8	6.7	5.4	3.8	2.0	1.0	0
LOWER	0.6	0.1	0	0	0.2	0.5	1.0	1.6	2.3	2.8	2.9	2.8	2.3	1.8	0.9	0.4	0

GOTTINGEN 362 (8)



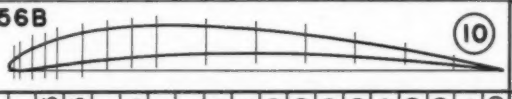
%	0	1.25	2.5	5	7.5	10	15	20	25	30	40	50	60	70	80	90	100
UPPER	0.7	2.3	3.4	5.2	6.5	7.6	9.3	10.2	10.8	11.1	10.9	9.9	8.5	6.7	4.7	2.5	0.3
LOWER	0.7	0.1	0.3	0.8	1.4	2.1	3.2	4.1	4.8	5.2	5.5	5.3	4.7	3.8	2.8	1.4	0

B-6358B (9)



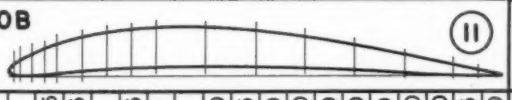
%	0	1.25	2.5	5	7.5	10	15	20	25	30	40	50	60	70	80	90	100
UPPER	0.7	2.2	3.1	4.4	5.7	6.5	7.8	8.6	9.0	9.2	9.0	8.2	7.1	5.8	4.1	2.2	.3
LOWER	0.7	0	0.1	0.4	0.8	1.1	1.9	1.5	2.9	3.3	3.6	3.7	3.5	3.0	2.2	1.2	0

B-6356B (10)



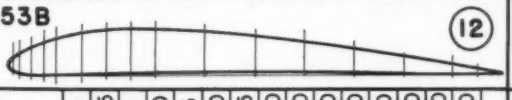
%	0	1.25	2.5	5	7.5	10	15	20	25	30	40	50	60	70	80	90	95	100
UPPER	1.0	2.7	3.7	4.0	6.0	6.7	8.0	9.0	9.5	9.8	9.8	9.1	7.7	6.3	4.3	2.3	1.2	0
LOWER	1.0	0	0	0.1	0.3	0.7	1.1	1.5	1.7	1.9	2.0	1.9	1.6	1.2	0.7	0.1	0	0

G-610B (11)



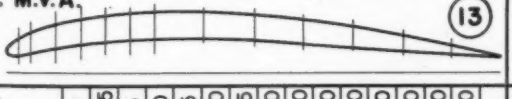
%	0	1.25	2.5	5	7.5	10	15	20	25	30	40	50	60	70	80	90	95	100
UPPER	2.0	3.8	4.7	6.0	6.9	7.5	8.5	9.0	9.0	9.0	8.5	7.6	6.5	5.3	3.8	2.1	1.2	0.3
LOWER	2.0	0.8	0.3	0	0	0.1	0.3	0.5	0.5	0.6	0.6	0.7	0.8	0.7	0.6	0.5	0.2	0

B-8353B (12)



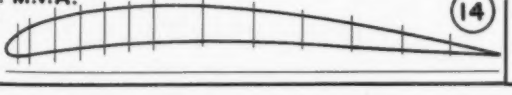
%	0	2.5	5	10	15	20	25	30	40	50	60	70	80	90	100
UPPER	4.5	7.1	8.4	10.1	11.2	11.9	12.3	12.5	12.5	12.0	11.1	9.7	7.9	5.8	3.7
LOWER	4.5	3.7	4.1	5.1	5.9	6.3	6.7	7.1	7.1	6.7	6.1	5.5	4.8	4.2	3.5

GOTT. M.V.A. 123 (13)



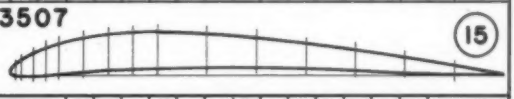
%	0	2.5	5	10	15	20	25	30	40	50	60	70	80	90	100
UPPER	4.4	7.7	9.2	11.1	12.3	13.1	13.5	13.7	13.6	12.9	11.8	10.3	8.3	6.0	3.6
LOWER	4.4	3.4	3.7	4.4	5.1	5.5	5.8	6.2	6.3	6.0	5.7	5.2	4.6	4.0	3.4

GOTT. M.V.A. 123 + 301 (14)



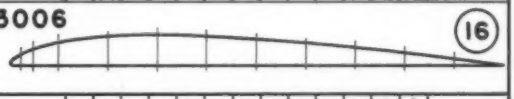
%	0	0.6	1.2	2.5	5	7.5	10	15	20	25	30	40	50	60	70	80	90	95	100
UPPER	0	–	–	3.0	4.6	–	6.7	–	8.3	–	8.7	8.4	7.6	6.6	5.3	3.7	2.0	–	0.3
LOWER	0	–	–	0.5	0.4	–	0	–	1.2	–	1.6	1.8	1.8	1.5	1.2	0.6	0.1	–	0

S.I.53507 (15)



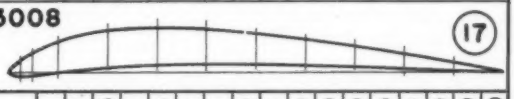
%	0	2.5	5	10	20	30	40	50	60	70	80	90	100
UPPER	0	2.3	3.5	4.9	5.8	6.0	5.7	5.3	4.7	3.8	2.9	1.0	0
LOWER	0	0	0	0	0	0	0	0	0	0	0	0	0

S.I.33006 (16)



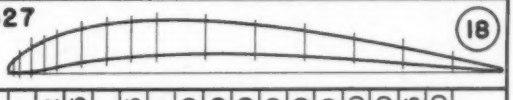
%	0	2.5	5	10	20	30	40	50	60	70	80	90	100
UPPER	0	2.3	4.5	6.7	8.3	8.7	8.4	7.8	6.6	5.3	3.6		0.2
LOWER	0	-1.0	-0.9	0	1.2	1.6	1.8	1.8	1.5	1.2	0.6	0.1	0

S.I.63008 (17)



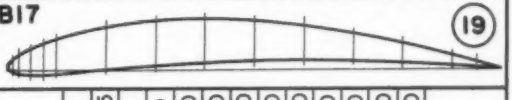
%	0	1.2	2.5	5	7.5	10	15	20	25	30	40	50	60	70	80	90	100
UPPER	1.0	2.6	3.9	5.6	6.8	7.7	9.1	10.0	10.5	10.8	10.4	9.6	8.1	6.6	4.8	2.8	0.9
LOWER	1.0	0	0.2	0.5	0.9	1.4	2.5	3.2	3.6	4.0	4.1	4.0	3.6	2.9	2.0	0.9	0

H-7327 (18)



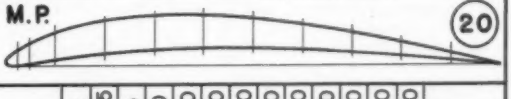
%	0	1.2	2.5	5	7.5	10	20	30	40	50	60	70	80	90	95	100
UPPER	0	2.1	3.0	4.5	5.5	6.3	8.7	10.0	10.3	9.9	8.8	7.4	5.5	2.9	1.5	0
LOWER	0	-0.7	-0.8	-0.9	-0.9	-0.8	0	0.8	1.4	1.8	2.0	1.9	1.5	0.9	0.5	0

A-93B17 (19)



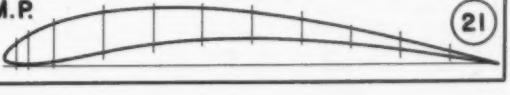
%	0	0.7	2.5	5	10	20	30	40	50	60	70	80	90	100
UPPER	0	3.0	4.6	6.9	9.5	10.5	10.5	9.8	8.6	6.8	4.7	2.5	0	0
LOWER	0.7	0	0.3	1.2	2.7	3.7	4.0	3.8	3.3	2.8	2.2	1.0	0	0

DAN. M.P. (20)



%	0	2.5	5	10	20	30	40	50	60	70	80	90	100
UPPER	1.6	5.0	6.4	8.7	11.1	11.8	11.7	10.8	9.4	7.4	5.2	2.7	0
LOWER	1.6	0.5	0.4	0.9	2.6	4.3	5.3	5.7	5.5	4.5	3.2	1.6	0

FIN. M.P. (21)



bulletin board

A "go-to-press" round-up of news and developments.

► Three very good booklets on rocketry: "Rocket Amateur's Guidebook," by Space Products Corp., 38 East 57th Street, New York 22, N.Y., is a compilation of source material of interest to amateur rocketeers. It tells where to get information on every phase of rocketeering—books, pamphlets, rules and regulations, plans and plenty of "how-to" sources. Also lists rocket clubs, professional societies, universities offering courses, military agencies and missile manufacturers. Includes information on where you can get kits and supplies. Price is $1.50 for a single copy, with lower prices for ten copies or more.

Second booklet is "Space Primer, An Introduction to Astronautics." This 72-pager is published by Convair and explains in relatively simple terms how rockets work, what problems must be overcome in leaving the earth and how man will manage to navigate in space. Main appeal is for people who want to know how these things are done but aren't too interested in putting a bird in orbit themselves.

For those who *are* interested in actually building and flying rockets, "A Guide to Amateur Rocketry" has been prepared by the U.S. Army Artillery and Missile School at Fort Sill, Okla. This one is for serious-minded teen agers (or older) who don't mind some theory and who have had some high school intermediate algebra. The Army specialists tell about propellants, rocket engine design, ignition systems, launchers, testing, performance analysis and SAFETY. It's a book for serious rocket groups who have the tools and equipment necessary for metal working and who have trained adult supervisors.

One very interesting paragraph discusses the legal aspects of building and flying rockets—and even the transportation of fuels to launching sites.

We quote the last two sentences in the book—which are applicable to any amateur rocket group: "It is only with extreme caution and great care that you can expect to have a successful and safe firing. Make your rocket project a gratifying experience, not a tragedy."

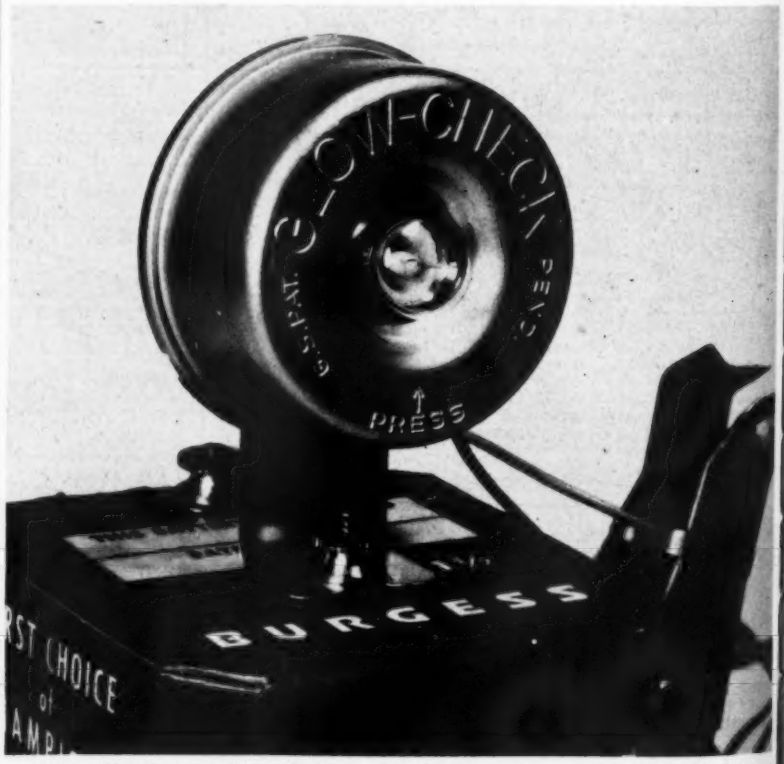
• • •

► Latest copy of the CCAMA News (that translates to "Connecticut Chapters of the AMA," and *you* translate AMA) indicates that the group is trying to get itself incorporated but seems to be stumped by legal fees. We know of one model club that incorporated—they did it cheap because one of their members is a lawyer—but had some difficulty convincing the authorities they weren't a bunch of delinquents. Reason for the problem was the club's name —Screamin' Demons of Long Island, which didn't sound dignified. They made it, though.

Coming back to the CCAMA problem, if anyone knows a lawyer "who is sympathetic to model fliers" please contact the editor of the News. John W. Affeldt Jr., Box 142, Gales Ferry, Conn.

• • •

► More and more clubs these days are building up this hobby by taking on beginners and teaching them all. F'rinstance: Mesilla Valley Model Airplane Club is a newly formed group whose first project is



Unique idea, the Irwin Ohlsson glow-plug tester. Don't remove plug, just press, and that's it.

instructing less experienced members in "the fine art of ukie flying." Anybody interested contact Frank V. Hansen, 1940 Missouri Ave., Las Cruces, N. Mex.

Ravin Cajuns (New Orleans, La.) do the same sort of job. Their latest bulletin gives a progress report on classes in building and flying of both free flight and control line models.

The Tacoma (Wash.) Aeromudlers have come up with a new twist on attracting youngsters. Feeling that there were plenty of frustrated beginners after Christmas with plastic yoyos. They couldn't start engines in, etc. The Aeromudlers printed up several hundred brightly colored cards saying "Model Aviation Builds Better Boys." These were then displayed in store windows, autos and so forth—with the Aeromudlers insignia to tell the boys where to come for instruction and help.

Lots of other clubs teach beginners—and it's a good idea. Everybody benefits—the kids, obviously, and the teachers, too, because they are model builders interested in having more modeling activity. And the more beginners that learn how, the more experts in the future and the more general modeling activity. Go to it!

• • •

► Other club bulletins received included the "Lookout" of the Hamilton Aero Modeling Association with plans for Hugh Tuck's T-Bomb ½A and an RC transmitter; the "Bulletin" of the Montreal Model Flying Club with plans for a good looking Nordic A-2 by Dick Foster; the "Hot Head" of the Vancouver Gas Model Club with plans for Hans Skadshiem's FAI job, the "O.C."; plus communiques from the Flying Groundhogs Model Club, the Mississippi Gulf Coast Model Club and the 6200th Air Base Wing at Clark Air Base, Philippine Islands.

• • •

► Heading up the list of trade items this month is a notice from the Hobby Industry Association of America that Rich Palmer has been named Retailer of the Year by the industry group. Rich Palmer is the Rich of Rich's Hobby Towne, Inc., Parsippany, N.J.—with seven acres of ground devoted to modeling activity, five control-line circles, two midget race car tracks and a boat pond. At the edges are parking facilities for 1000 cars and bleacher seats give a good view to our favorite activities for 1500 spectators. Rich sponsors three clubs, too, one each for model airplanes, cars and boats. Sure, Rich is doing himself some good—but he's doing the hobby still more good!

Ambroid Co., which recently brought out a fast-drying colorless model airplane cement, now announces a new plastic cement for polystyrene models. Most of the old timers we know hope that no matter how many new-fangled stickums Ambroid brings out, they never quit making the old amber-colored stuff that gives the company its name!

Super-Flite Aircraft Spray is a new butyrate dope for model work announced by Cooper Industries, Inc., makers of full scale aviation finishing materials. We haven't space to list all the colors, but they're keyed to full scale colors. As: Fairchild Blue, Stinson Green and Piper Cub Yellow. Claimed to be 100% fuel proof.

Leland Morton and Les Grogan have won the $100 prize put up by Harter's Hobby Products for the first flier who set an official AMA Proto Speed record using the Regal Raider kit. Clocking was 121.45 mph with a modified Fox 29R. Harter is now offering $100 to the first one to beat 125 mph with a Regal Raider—and he'll add $50 for each additional mph!

The Hand Launched Glider

(*Continued from page* 28)

If a wire leading edge is to be used, it should be cemented in place at this time. Music wire of .008 or .010 diameter is cemented in place at the lower surface leading edge corner using plenty of cement and allowing about 1/16" gaps at the dihedral breaks.

The leading edge shape is carved to the line on the top surface as in figure 2.3b, leaving the edge about 1/32" thick. The trailing edge shape is also carved to this line leaving the edge and the tip about 1/32" thick. Nowhere should the edge thickness be carved to less than 1/32"; the remaining shaping should be done with sandpaper. Some typical airfoil sections are shown in figure 2.4; all have their own peculiar characteristics, and experimentation is the best way to determine which one suits you best. In most cases either the triangular (figure 2.4a) or the curved (figure 2.4b) airfoils will prove excellent. These airfoils are the most popular with present day glider fliers. The blunt airfoil (figure 2.4c) seems to have lost popularity in the last five years and the undercambered section (figure 2.4d) is most often employed on low ceiling indoor gliders.

The wing now should be sanded lightly using the 2/0 paper to remove the high spots left by the carving. At all times the sanding should be done using the sanding block behind the sandpaper to ensure a smooth and even surface, free from scratches and hollows. Care should be taken to prevent the edges of the sandpaper from scratching the surface and dust should be prevented from accumulating beneath the sandpaper. Use the 6/0 paper to thoroughly sand both the top and bottom surfaces, and then follow with the 320 to obtain a smooth, silky feeling finish. Where the wing tapers toward the tip, the sanding should be done in one direction only, toward the tip, to avoid raising the grain. The trailing edge should taper to almost paper thinness.

Cut the wing panels apart along the dihedral break lines, taking care to follow the lines laid out with the square. It is very necessary that all the dihedral break lines be parallel and at right angles to the chord line of the wing. Any offset here would result in a built-in warp in the wing. Dihedral joint angles can be accurately set by placing the wing panel along the steel edge of the work board and sanding the end of the panel at a bevel corresponding to the dihedral desired, as in figure 2.5. Joining the panels is done in three steps. First, all the surfaces of the joints are given two coats of cement to assure the cement penetrating into the wood, allow it to dry thoroughly before applying the next coat. Next, a heavy coat of cement is placed on the joint and the panels joined together and blocked up at the correct angle. By far the best way to make sure that the outer panels of a polyhedral wing have equal dihedral is to join the tips to the center panels and then block them up tip to tip. The center joint is joined in the same fashion when the tips have dried. When all the joints have thoroughly dried, they are again coated with a film of cement.

The tail surfaces are cut to shape and the airfoil sanded in the 6/0 and then 320 paper. Skip the carving and 2/0 sanding on these surfaces—the wood is too thin for such heavy work. As on the wing, the trailing edge is tapered to almost paper thinness. The center line of the stabilizer should be carefully marked to assure accurate alignment in joining it to the fuselage. The lower edge of the rudder must be accurately shaped to fit the body or the stabilizer airfoil as the need requires.

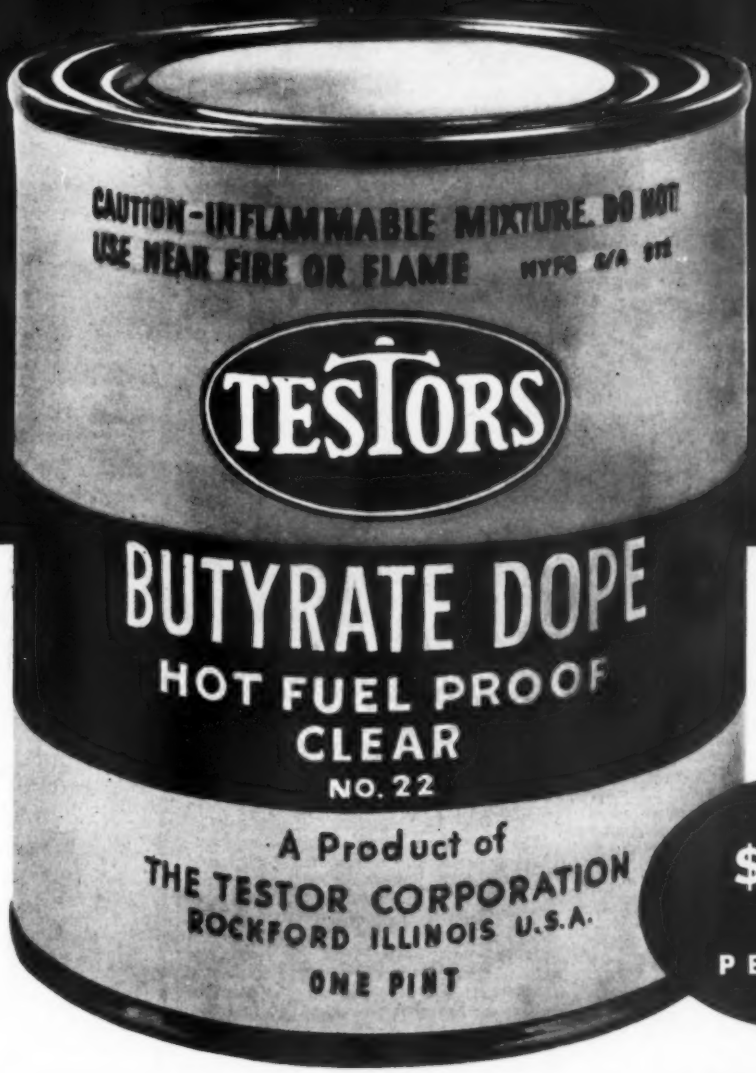
The design of the fuselage, its shape and cross-section, is largely determined by the grain and density of the wood to be used. The body should taper uniformly between the wing and tail, the corners should be rounded and the fuselage behind the stabilizer leading edge should taper to a point. Lumpy carving and sanding causes weak spots where the bending and impact loads imposed on the body during launching and landing will concentrate, causing the body to break. In most cases circular or round ended rectangular cross-sections are best with flat or shallow V areas left for mounting the wing and stabilizer. The wing and stabilizer mounting areas should be carefully checked with a straight edge (figure 2.6 to make sure the incidence set-up is zero-zero—checking back to Part I at this time might be helpful; see figure 1.8). A couple of careful swipes of the 6/0 sandpaper in the right places will cure any misalignment present. The wing and stabilizer mounting surfaces and adjacent areas of the fuselage should be coated at least twice with cement before assembly, as were the wing dihedral joints.

When assembling the wing and tail surfaces to the body, use plenty of cement; squeeze the joints tightly and wipe off any excess glue. Assembly should be made in the following order: stabilizer to body, checking with the square to make sure the body is perpendicular to the stabilizer; wing to fuselage (after stabilizer has dried completely) using blocks to hold wing tips so that no tilt is present in wing (check dihedral at each tip with a ruler to make sure); rudder to body, using the square to get rudder perpendicular to stabilizer. When all the joints have completely dried, coat them and the wing dihedral joints as well with an additional coat of cement.

After assembly, several hours should be allowed to permit the joints to set thoroughly before tackling the finishing job. Check the assembled glider for warps or any misalignment and re-cement the affected joints to remove the faults. Two popular ways of finishing the glider will be discussed. The first method employs sanding sealer and requires more time, more careful sanding, and will result in an excessively heavy model if improperly done. The resulting finish is usually better than that of the second method, which is quick, easy and light and is recommended for the beginner. Before using either method, sand the entire model with 320 finishing paper to remove any fuzz or excess cement.

In the first method, nitrate base sanding

(*Continued on page* 38)



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15¢

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sealer (butyrate is not as good) is cut about 50-50 with thinner and one coat is applied to the whole model except the trailing edges of the tail surfaces. When this coat has thoroughly dried, it is sanded off using the 320 paper. By "off", I mean exactly that; sand right down to the bare wood leaving the same silky feeling surface as before. Stop sanding as soon as the sealer is removed from the surface; too much sanding will open up pores and grain in the wood which the sealer hasn't filled. Another coat is applied and it, too, is sanded off when dry. This should leave the surfaces with a slick feeling finish with no fuzziness and no grain showing when light is reflected from the surface. Should pores and grain still be visible, use a third coat and sand it off as before. For outdoor gliders, or if a high gloss finish is desired, give the model one coat of thin clear dope. This method of finishing depends upon the builder being familiar with the sealer's characteristics and his own sanding habits. Also, the model must be smoothly sanded before applying the sealer.

In the second method, talcum powder is rubbed into the wood of all the surfaces. Apply the talc freely and rub it well into the pores of the wood. Then apply a coat of thin dope over all the model except the trailing edges of the tail surfaces. Sand the dope almost entirely off, stopping just before the bare wood is reached. If carefully done, only one such treatment may be enough. Should examination reveal grain showing on the surface, a second treatment may be applied. Again, if a gloss is desired, a thin coat of dope may be applied.

The question of whether to wax the glider or not will start an argument wherever glider fliers gather. Wax keeps the tail surfaces flexible and prevents moisture entering the wood and causing warps. Wax prevents cement from drying properly and weakens cement joints made in repairing field damage. If you want to wax your model, apply paste wax (I prefer "Simoniz"), rubbing it onto the surfaces briskly, leaving a slight film. When this film hardens, polish the model lightly with a soft cloth until a high gloss is developed.

With Part II is presented another glider design, the "Mohican", designed by Tem Johnson. This model is a very stable flier and is one of the most consistently high performing designs I've seen.

Now that the design and construction details have been covered, there would seem to be little left to discuss on the subject of hand launched gliders, but there is much to be said on the subject of flying these little models, especially concerning the launch and throwing techniques. Part III will cover this and give plans for "Curly", the present record indoor glider.

The Pied Piper

(*Continued from page 23*)

If there are club objections to this method of control, there is nothing that says there cannot be two brackets in the elimination heats. One bracket composed of the fast models, the other bracket of the somewhat slower models; the final race or heat to be of the 140-lap, two pit stop type, composed of the winners of both brackets.

Yet another method of control is to appoint a different event director for each day of club racing. He should have the authority to select the racing site and name the type of racing to be held on that day.

To meet all types of contest conditions, the rules permit contestants to enter two models, at the time of registration. The point here, of course, is that a contestant may go to any contest armed with two types of models. The small fast model and the larger model with the good landing and take-off characteristics.

In the first type of contest Rat Racing mentioned, that of short fast heats, it would seem that the contestant's logical choice would be the small fast model, if the terrain is smooth. If rough, he can afford no take-off flips in this short dash, so his choice should be the larger model.

In the second type of contest racing, with the smaller number of contestants and longer race, his choice would again depend upon the ground surface and upon his competition. The race isn't always to the swift. Dependability is just as large a factor as speed.

In the last type of race with the mixed heats of both fast and endurance types, the contestant can use either style of model, or can change models between heats, or even change motors in either model between heats.

DESIGN

Rat Racing is divided into three important parts: the model, the motor and the crew. We intend discussing only the first two, but in closely competed races the pit crew is just as important as the model and the motor.

In designing a model for any event, one should consider the problems peculiar to that event. The best model is the one that answers those problems most satisfactorily.

In Rat Racing we need a model capable of maintaining a high average top speed. Every portion of the design must contribute to this speed. So we must consider fast and easy service by the pit crew, ground stability, fast acceleration, flight stability and top speed.

The Pied Piper is strong in all these departments. It weighs in at 15 ounces, without fuel. This means fast acceleration, short take-off space and lower impact on landings.

The parts that do the most work and absorb the most punishment, the motor and tank mount, the landing gear and bell-crank platform, are beefed up in an integrated unit. The typical weakness of the profile model, the joining of the wing and fuselage, is not present in the Pied Piper. This joint is more solid than in most box-fuselage models.

Since the motor is profile mounted toward the outboard wing and the bell-crank is inboard mounted, perfect control is maintained at all times without extra weight in the outboard wing tip.

The center of gravity is well back, and the wheels are well forward and wide apart for good ground stability. A team racer type landing gear avoids bouncy take-offs and landings.

The center of lift is located at 35-40%

(*Continued on page 40*)

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Designer Approved All-Transistor Receiver Kit

The TR 4.5, an all transistor 27-1/4 mc. receiver, is sure to appeal to the advanced radio control enthusiast. Its many fine features, including reliable operation over a wide temperature range, high current change, ultra economical battery life, is sure to win many friends.

To assist the advanced builder in making his unit, a complete parts package is being made available along with instructions.

All required components have been assembled and the total price is less than if the parts were purchased individually. The package includes three special transformers, a special Gem relay, four transistors, including a specially selected and tested A01 to insure operation at 27-1/4 megacycles.

All coils are completely wound. A special ferrite core RFC is used to insure small size. Allen-Bradley resistors and Goodall capacitors are used throughout.

A special light weight aluminated case is also supplied to make a compact unit measuring 2x2-7/8x3/4 in. Weight is slightly over two ounces.

The units requires only 4-1/2 volts of battery and idles at 2 mils, which upon receipt of modulated signal of 400 cycles at 100% rises to 35 to 40 mils for really reliable operation.

Temperature checked from 130 down to 20 degrees and operation is reliable throughout this range. The TR 4.5 is not recommended for the beginner or the R/C fan with limited radio experience.

It is available only from Ace Radio by special arrangements with the designers Don Kamm and Red Costlow. Another Ace exclusive designer approved kit. Complete parts package, nothing else to buy except batteries, only **$22.95**

OTHER DESIGNER APPROVED RC KITS

For several years Ace has worked with top R/C designers to produce exclusive designer-approved control kits, in which the designers themselves have selected and approved components used. Here are some ACE R/C exclusives:

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Now - go multi with proportional rudder and elevator with the Simpl-Simul by John Worth. Converts single channel CW or audio receiver and transmitter to give proportional rudder and elevator with true stick-type control. Receiver must be capable of following 10 cps.

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At last, a simple fool-proof dual channel simultaneous receiver and transmitter, designed by Marcy Inkmann, developer of the MarcyTone single and six channel receivers.

Now you can use either channel for push button or pulse flying since each channel may be pulsed simultaneously up to 20 cycles per second.

Marcy's TwinSimul receiver kit contains 6007 tube, three T0037's, two Gem 5K relays, two filters and all other required components. Weight is under five ounces. Unit measures 2-1/2 x 3-5/8 x 1-7/8 inches deep. Only **$27.95**

Marcy Twin Simul Transmitter - Dual-tone generators housed in a 3x5-1/2x 8 case use an MOPA-type RF section with a 3A5 two-tube amplifier. May be operated with push buttons or with dual pulser below for twin simul proportional control. Complete unit including transmitter and twin simul tone generators. **$37.95**

Marcy Twin Simul Tone Generators - Housed in aluminited case 2 x 4 x 4 for converting existing MarcyTone equipment to dual operation. **$17.95**

Marcy Twin Pulsers - Stick control housed in small metal case plugs into twin simul tone generators for dual proportional flying. Motor control may be added, using either full on or full off. **$32.95**

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of chords, the aspect ratio is seven to one. The center of gravity and center of resistance are located below the thrust line. All of these points contributing good flight stability at all speeds. There is no hunting or tail wagging in flight.

The fuel tank is pressurized by slip stream and well located for easy starting and good fuel feed at high speeds. The tank is of sufficient size to accommodate .29's or .35's and for experimenting with different fuels and props.

Motor and tank are out in the open, run cool, and permit easy service by the crew. Quite often green crew men have to be used; consequently, the less complicated the starting procedure the better. Under the rules you can use a fuel shut-off or not, as you prefer. With the use of green crew members, the wisest choice would be just a tank.

The wing features a new type of construction easy for those of limited experience. It is light but sufficiently strong, since the center of the model absorbs the punishment. The wing is a thin, lifting, speed type which tapers toward the tips.

The stab and elevator areas are large, and shaped to give good control at all speeds with low proportionate braking action. This model can be looped or figure-eighted.

CONSTRUCTION

Start from the bottom up when building the wing. Place waxed paper over the plans. The planking for the leading and trailing edges go down first, then the cap strips and the center plywood platform, after it has been drilled for bellcrank and landing gear. Blind mounting nuts are used for the landing gear and ¾" Phillips-head bolts are the right length to allow clearance for the bellcrank. After fitting, the landing gear is added when the rest of the model is completed.

Before adding ribs, place bellcrank in position and draw lines where the lead out wires go. Wires go between the ribs and the bottom cap strips, so ribs are temporarily located, wire positions marked, and ribs notched before cementing. Top leading and trailing edge, center planking, and cap strips are added after installation of bellcrank, lead out wires and push rod. Stab, rudder, fuel tank and top of wing and fuselage joint are faired in with triangular strips split from ½" sq.

The Pied Piper was finished with four coats of clear and sanding filler, three coats of base color and one coat of spray-can trim.

Motors: Choose a motor that has plenty of sock, is easy to restart when hot and, considering refueling time and weight saving, reasonably economical to operate. By applying these requirements to your local or general conditions, your choice should be easy. I prefer the good .29's and .32's although the top displacement allowable is .36.

On the smaller sized props, the smaller motors will turn up just as fast, are easier to restart when hot, and more economical to run.

In every contest, and sometimes in every event, a motor will start revving up, that will cause all contestants within hearing distance to turn their heads to listen. Such a motor is above average in performance, one of the "good ones." Despite the high standard maintained by manufacturers, and numerous inspections designed to uphold those standards, occasionally there are motors that prove to be exceptionally good. Others are "dogs." Extremes occur in all fields of manufacture. If you are fortunate enough to own one of the good motors, baby it and take care of it, use it only in contests, as there is only so much time at

peak RPM on any motor.

You are fortunate if you own such a motor because, unless you are lucky, finding one can be expensive. There are three ways that you can acquire such a motor. The first is to buy and try, and rebuy, until you hit. The second way is to buy a motor and then buy extra parts, replace each part or parts until you find the combination that clicks. The third method is to purchase a motor from a firm that deals in, or reworks, motors and have them guarantee results. This latter method may look expensive but after you've had a taste of the first two methods, it can be inviting.

Some manufacturers prolong the useful peak of their motors by methods that will permit them to still sell motors at competitive prices. One of these methods is to impregnate the walls with lead, another to temper the liner beyond the hardness of the usual liner; third (a high priced motor) uses chrome sparingly in the interior.

Further use of chrome can be made to prolong the life of a motor that is beyond the cost point of the manufacturer who must stay within the popular-price bracket. This more extensive use of chrome will cost about the price of an additional motor but will maintain the peak of a hot motor to the life of that of several other motors.

I am told that chrome is bonded to the basic metal in the form of a network of lacy veins. While it may look solid to the eye, there are many small openings in the coating. Since the coating is not a solid wall, there is less friction between the piston and liner, resulting in less drag, less wear and higher RPM. In addition, oil is caught in the openings, assisting in lubrication and cooling, again reducing drag and wear. Chrome is the hardest metal used in model motors and other contact surfaces such as the crankshaft and crankpin may be coated with it.

The reason for the high cost of chroming is that chrome seems to be contrary to work with; it may take several attempts before the right pattern of coating is deposited.

Any of the above methods are resistant to careless methods of breaking in of motors or to lean runs that would ruin a motor without such extra protection. A few years ago, it would have been impossible for you to reach the top in modelling, unless you were especially adept with tools, had a well equipped machine shop and well lined pocket book. At the present time, while it still takes a chunk of change, it is possible for anyone to reach the top, because there are others that will do the work for you, both manufacturers and specialists. How far you want to go, depends on your ambition. For a good model, such as Pied Piper in Rat Racing, a good motor is required, and a good pit crew can take you right to the top.

conrad conrod

International Airfoils

(*Continued from page* 30)

Gott.-495: Should be good for A/2. Reschenberg.

B-6306B: A/2, A/1, Wakefield. Use same airfoil or B-8306B in stabilizer. Very low sink rate, but may be difficult to trim in rough air. Source: East German Aero Club.

B-8306B. A/2, A/1, Wakefield. More stable airfoil than 6% thick section but has higher sink rate. Slow glide, good in wind. Might also be used for FAI power. East German Aero Club.

Gott.-362: A/2 and A/1. Horst Eichenhaur, first German Nats 1957.

B-6358B: A/1 and A/2. Somewhat highly flexed for maximum duration but with turbulator at about 50-60% of chord should reach 2:45 with good gust and thermal stability. Use B-6356B in stabilizer. East German Aero Club and Denzin.

B-6356B: A/1 and A/2. High performance. Might be difficult to trim in wind. Still air should give 3:00 *plus*. Use same airfoil in stabilizer with "curled" trailing edge, per Edith 2. Denzin, who uses section, rates it high.

G-610B: Power airfoil. Can be built flat on bench. This is the Carl Goldberg section; source Czech Aero Club.

B-8353B: Used by winner of the 1958 FAI power event. Gives very good climb with good glide.

Gott. M.V.A. 123: A/2. Good for still air.

Gott. M.V.A. 123 plus 301: Very good for FAI power. Use 8% thick stabilizer Clark Y.

S.I. 53507: Very good Wakefield section. Klaus Hersch.

S.I. 33006: Stabilizer airfoil, may be used for Clark Y 8% thick.

S.I. 63008: Good for A/2.

H-7327: Germans say good for A/2.

A-93B17: Lothar Piesk says good for FAI power. (Piesk models noted for climb —Editor.)

DAN. M.P.: Hans Hansen's A/2 Championship Glider, 1954.

FIN. M.P.: Very stable but good only for two minutes, used in Finland for rough air, and due to strong, cold-air thermal conditions.

Men and Ships

(*Continued from page* 17)

Sevenaya, Zemlya, Yakutia, Petropavlovsk, Sea of Okhotsk. Owing to bad weather, a landing was made on the Island of Udd, one of what were later called the Chkalov Islands in honor of the plane's commander. The distance flown was just over 5800 miles. A map of the route was later painted on the tail of the ANT-25.

Chkalov and Biadukov were military test pilots, and Beliakov a crack navigation expert and instructor for the Red Air Force. After the 1936 flight, they all returned to regular duty, their appetites whetted for another try the following season. Meantime, trips were made to TSAGI in Moscow where development work on the plane and test flying proceeded, in cooperation with the engineering staff headed by Comrades Stoman and Berdnik.

The fliers had as their goal an extension of the Stalin route right over the North Pole to North America. The idea previously been vetoed by Stalin in favor of the less ambitious Moscow-Chkalov Islands journey to test the plane and crew. With the experience of that flight behind him Chkalov again put forward to Stalin and Voroshilov the plan for the North Pole flight, spurred on by the establishment of a base at the Pole by Russia's "Commissar of the Ice", Dr. Otto J. Schmidt.

A very considerable portion of the

modern Soviet empire lies above the Arctic Circle, and since 1932 in particular the whole area had been opened up under control of what was then the Central Administration of the Northern Sea Route. Schmidt sailed on several preliminary explorations of these Northern territories and in 1932 made the North East Passage from Europe to the Bering Straits in one navigation season.

Aviation played an increasing part in these Arctic probings—scouting for ships, mapping and exploring, supply dropping; and in the case of the sinking of the "Chelyuskin", trapped in shifting pack ice in February 1934, taking off the entire crew and passengers marooned on the ice floes.

Schmidt's North Pole base was established and maintained entirely by aircraft, and from the met. station there valuable scientific data on Polar weather conditions would be made available to Chkalov.

At last, Chkalov and Biadukov were summoned to Stalin's Moscow office, where also waited Molotov and Voroshilov, to personally put forward their plan. That other famous Soviet flier, Sigmund Levanevsky, was also there to present his alternative plan of a North Pole flight in a four-motor machine; (he later made an ill-starred attempt which ended in disaster after engine trouble and bad weather were encountered soon after crossing the Pole).

Stalin called in Alksnis, chief of Soviet aviation, and while they were waiting for him, conversation ranged over many aspects of flying, including the valuable knowledge gained from study and purchase of U.S. aircraft and equipment.

When he arrived, Alksnis gave Chkalov the go-ahead, endorsed by Stalin and the others. Final preparations took less than three weeks, but in fact the flight was backed by two years preliminary work by the Committee of Long Distance Flights, which was responsible for the training and teaming of record crews and development of equipment and aircraft.

A batch of the latest American charts were a valuable last-minute addition to the assorted gear bundled into the plane before the take-off on June 18, 1937. Tupolev was there to see them off. A white flag wagged, and the red-winged plane began to trundle along the narrow single concrete runway. At six minutes past, one the wheels lifted, Biadukov quickly retracted the landing gear, and with Chkalov at the controls the crew settled down to the flight routine, escorted on the first leg of the journey by an old twin-engined ANT-4 and another plane.

As they flew North towards the Arctic wastes, an early scare came when oil began flooding the cabin floor; eventually the cause was traced to overfilling of the system caused by over-enthusiastic pumping by the crew.

The next hazard was ice. Frantic work with the propeller de-icer cleared the prop, but ice still gathered on the wings and tail. Weighed down by the heavy fuel load, the plane inched upwards, until at 8200 ft. over the Barents Sea it broke through the cloud into brilliant sunshine, and the ice began to break away.

Further tussles with ice as the machine droned onwards over a sea of water and ice—this time the plane had to claw its way to 13,600 ft. before clearing the cloud.

Slowly, monotonously, the hours slipped by. Chkalov, having spent the first eight hours at the controls, was asleep when, soon after 4 a.m. on June 19th, in brilliant sun and unlimited visibility, Biadukov and Beliakov looked down from 13,600 ft. on the wilderness of fissured ice that was the

(*Continued on page 46*)

Scientific introduces the brand new "super 6" for

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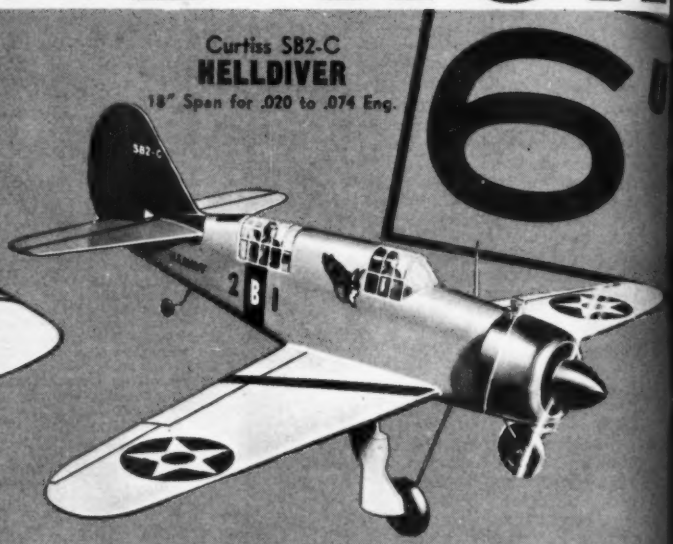
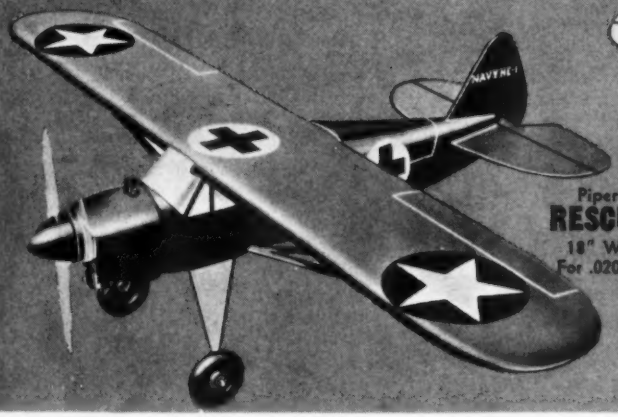


Curtiss SB2-C
HELLDIVER
18" Span for .020 to .074 Eng.



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SPAN: 14" For .020 to .049 Eng.
Brand new profile stunt model with a big 80 sq. inch wing. U-Control flyer. All prefabbed.

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SPAN: 18" For .020 to .074 Eng.
A real "beast" of a model. It's authentic scale . . . for U-Control flying. Prefabbed. Carved fuselage.

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Bullet-like styling . . . bullet-like performance. Big 24" wingspan on this U-Control thriller. Prefabbed.

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"Supersonic" Missile $2.50
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Real "space age" U-Control model of ground-to-air guided missile. Takes off vertically, too. Prefabbed.

SEE YOUR DEALER . . . BE SPECIFIC, SAY SCIENTIFIC

DERFUL FLYING!

Pole, distinguished only by their calculations and the sensitive whirlings of the compasses.

Past the Pole and headed South again for North America, the plane reached its 18,700-ft. ceiling, cruising precariously, losing height at every bump, dodging cloud or boring into it, fearful of ice.

Spasms of frenzied activity interrupted the tedium of their solitary flight; an ice blockage in the cooling system nearly seized the motor; ice caused them to inch up and down the heavens, seeking clear air. But finally at 4:15 p.m. the same day, after 40 hours flight over 3860 miles, Cape Pierce Point in the Canadian North West Territories came into view. At 6 p.m. they were over the Great Bear Lakes, and two hours later, the great Mackenzie River and mountain range.

A front of storm clouds forced them to turn West towards the Rocky Mountains and the Pacific, mountains forced them higher and the oxygen supply began to give out. At 20,000 feet they had to carry on with an occasional whiff of oxygen, nursing the diminishing fuel supply fighting against the lassitude and anoxaemia.

And with the oxygen finally gone, they were forced down again until at 13,000 ft. they broke cloud to see the Pacific Ocean beneath. At the expense of a four-hour diversion, the worst of the weather had been avoided, and the Rockies crossed.

Turning South again down the Pacific coast, Queen Charlotte Islands were passed. Then the sun which had alternately blinded down or been dimmed to grayness, filtered by swirling mist and cloud, sank below the horizon. In the gathering darkness, flying blind in cloud and hail, Biadukov sat at the controls watching the instruments, the dimly-lit cabin behind littered with equipment and the bodies of his sleeping companions, feeling unutterably alone.

First the Seattle and then the Portland radio beacons guided them in. Past Portland the fuel gauges began to flicker on the "empty" stop, so a turn was made back into the Portland beam. They eventually slipped into the soggy field at Vancouver, Washington, after 63 hours 17 minutes in the air and 5507 miles from their take-off field.

Chkalov did not break the existing long-distance record, but his flight was a true pioneering effort and set the stage for a second, successful, attempt the following month. Colonel M. M. Gromov, Commandant A. B. Youmachev, and Engineer S. A. Daniline set off from Chelkovc Airport, Moscow, in the modified ANT-25 registered NO25-1 along the route Matochkin Char, Novaya Zemlya, Rudolf Island, and the North Pole. Sixty-two hours later, having flown 6262 miles, they landed at San Jacinto, California, to set a new world's long distance record for the Soviet Union.

Thus ended a series of flights which, apart from the prestige gained, obtained for the Russians priceless information and experience in Arctic flying and Polar weather conditions. Now, the Soviets have a veritable Arctic air empire based on a network of military and meteorological stations clear across the roof of the world.

Biadukov and Beliakov had distinguished careers in the Soviet Air Force during WW2, reaching Major-General's rank. The latter's 1957 comment on the flight as a Lt.-General of Aviation (Biadukov also reached this rank) was:- "On the wings of the ANT-25 we carried warm greetings from the Soviet people to all the people in America, the desire of Soviet people to live in peace and friendship with all peoples."

Chkalov was killed on December 15,

1938 while testing a new aircraft. The son of a railroad worker (his mother was an office cleaner), he had risen to become perhaps the best known Russian flier of the period.

Made a hero of the Soviet Union, like Chkalov, for his services to Russian aviation Mikhail M. Gromov was born in 1899 and received his pilot's license in 1917. After the war he led long distance flight from Moscow to Peking in 1925, in 1927 worked at the Stalin Aircraft Works Plant No. 1 in Moscow, having the year previously piloted an ANT-3 on a round-Europe propaganda flight. Early in WW2, Gromov headed a Soviet air mission to the United States to study methods of aircraft production. Back on the Russian front, he commanded a Stormovik group and finished the war as a Colonel-General. In 1946 he became Chairman of the Presidium of the Chkalov Central Aero Club, and a year later visited England a second time as head of a Russian delegation.

The original ANT-25 was designed in 1932—it is said by order of Stalin himself—by P. O. Sukhoi under the direction of A. N. Tupolev at the Central Aero-Hydrodynamic Institute (TSAGI), Moscow. Much was made at the time of the machine's completely Russian origin as to the motor and equipment, as well as the airframe, although in fact some of the instruments were of English and U.S.A. manufacture.

The machine was of conventional all-metal construction, spanning about 112 ft. and extending 44 ft. in length. Overall height was 18 ft., aspect ratio 10, wing area around 945 sq. ft., wing loading 26.4 lb. sq. ft., and power loading, based on a normal 900 h. p. output, 27.7 lb./h. p. Empty weight was roughly 9250 lb., but an enormous 13,000-lb. fuel load—enough for over 7000 miles flight—chiefly contributed towards the 24,885-lb. gross weight. Slightly differing figures were given in various contemporary sources, but all added up to the same general picture.

Power plant for the later record flight was an AM-34R 12-cylinder Vee liquid-cooled 900-1000 h. p. engine driving a large-diameter adjustable-pitch 3-bladed propeller, giving a top speed around 150 mph. Special attention was paid to the engine cooling system to allow fault-free cold-weather functioning.

A Russian photo shows a modified earlier version, labelled ANT-25 (RD), with a blunter nose, lower thrust line (probably with an inverted Vee engine), and tiny two-bladed propeller, but the AM-34R model was used for the North Pole flights.

Aft of the engine was the pilot's seat, over the front spar. A full complement of blind flying instruments was provided, but no automatic pilot. The remainder of the crew's quarters comprised a long narrow cabin, with first a rough bunk, then a midships position for the navigator facing the starboard wing trailing edge, and behind him the second pilot's position with dual controls.

Navigation and radio gear was very com plete and included two transmitters and a wing root-mounted receiver, radio compass (the loop for which was carried either on the roof or the belly), two aperiodic compasses, a sun compass in a small transparent canopy on the fuselage roof over the wing, and assorted chronometers and timepieces.

Side-folding hoods covered the front and rear pilot positions, and the navigator had his own transparent hatch above the compartment. For emergency use on the ground, a gasoline-engine generator was carried in the rear fuselage to work the

(*Continued on page 50*)

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NOW!

A Complete Line of TOP FLITE

NYLON PROPS

that are indestructible under normal use!

These marvelous props were perfected after years of intensive work in design and development! They are the strongest props made! Field tests prove they will outlast any other kind almost 50 to 1, reducing the cost per flight to the absolute minimum. They are flexible, heat-proof, fuel-proof and have a super high gloss finish. They deliver the best all around performance of any prop!

SIZE	EACH	SIZE	EACH
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The Safety Tip Stripes in contrasting bright red indicate the extreme tip of the prop to help prevent accidents. And this trim adds beauty and lots of dash, too!

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deliver the MOST THRUST from ANY engine
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15c each
TOP FLITES:
4½-3, 4½-4, 4½-5
POWER PROPS:
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20c each
TOP FLITES:
6-3, 6-4, 6-5
POWER PROPS:
5¼-3, 5¼-4, 5¼-5, 5¼-6, 6-3, 6-4, 6-5, 6-6

25c each
TOP FLITES:
7-3, 7-4, 7-6, 8-3½, 8-5, 8-6, 8-8, 9-4, 9-5, 9-6, 9-7, 9-8, 10-3½, 10-5, 10-6, 10-8
POWER PROPS:
7-4, 7-6, 7-8, 7-9, 7-10½, 8-4, 8-5, 8-6, 8-8, 8-9, 8-10½, 9-6, 9-8, 9-9, 9-10½, 10-6, 10-8

35c each
TOP FLITES R/C:
11-3, 11-4, 11-5, 11-6, 11-8, 12-3, 12-4, 12-5, 12-8
POWER PROPS R/C:
11-3, 11-4, 11-5, 11-6, 11-8, 12-3, 12-4, 12-6, 12-8

40c each
TOP FLITES R/C:
13-5½, 14-3, 14-4, 14-6

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radios. Other emergency gear included an inflatable rubber life raft; flotation bags in the wings and front fuselage to add buoyancy in a forced landing on the sea; electrically-heated survival and flotation suits; and rations for a month and a half stowed in wing leading edge compartments. Heating was by warmed air passed over the exhaust stacks and through cabin ducts.

The wing center section was an integral part of the fuselage structure. Attached to the stubs were long finely tapered metal-covered outer panels of ANT-6 aerofoil section, with pronounced chordwise ribbing on upper and lower external surfaces, the whole fabric-covered, painted and lacquered to give the smoothest possible finish. Internal structure was based on a three-spar box beam, part of which formed a sealed compartmented integral fuel tank. Twin-wheeled main landing gears retracted backwards into large fairings attached to the bottom surfaces of the wing trailing edge. The tail wheel was neatly faired but non-swivelling. Horizontal stabilizer was wire-braced and its incidence adjustable for trimming.

For the Chkalov flight, the machine was as illustrated in the tone general arrangement drawing. All wing and horizontal tail surfaces were painted red to make the plane visible from the air should a forced landing be made in the snow. The fuselage was silver, but with the nose and narrow stripes along the fuselage upper and lower centre lines painted a dark color, probably black. The legend "Stalin's Route" was painted in Russian along the fuselage.

(Acknowledgements: "Flight" and "Soviet Weekly" for the photographs; "The Aeroplane"; The Royal Aeronautical Society; "Aero Digest" for August 1937, and other contemporary magazines: "Over the North Pole" by George Biadukov; Miss Jean Alexander.)

Whip-Control Starfire

(*Continued from page* 25)

parts of final sanding with fine sandpaper the model is now ready for assembly.

Insert the wings into the slot provided for them in the fuselage, block each tip up ¾" and cement them securely in place. Now attach the two elevator halves to the fuselage, making sure that they are properly aligned before the cement sets. Mount the rocket pads and fuel tanks and the assembly is now complete.

Wing and tail fillets are made by applying a large amount of cement to the junctions of the two surfaces and smoothing it off with the fingertip. Several coats may be necessary to build them up to the desired size. Bend the control line hook from a paper clip and attach it to the left wing tip as shown on the plan. After balancing the model at the point shown on the plans by adding weight in the hole provided beneath the nose, plug the hole with scrap balsa, sand it off smooth, and the model is now ready for finishing.

Give the entire model at least three coats of sanding sealer and, when dry, sand thoroughly with fine sandpaper. Now brush or spray on three coats of aluminum dope. The trim areas are masked off and painted the colors indicated on the plans. Finally, apply the star decals, the control surfaces and other markings, with india ink and ruling pen; give the model a coat of wax and she is ready to go.

For best results the model should be flown with a rod and reel type of fish pole, since the line can be let out in flight, thus simplifying launching. Dig that old rod and reel out of the attic or hall closet and you're ready for a flight. The length

of the rod will determine the amount of control you will have over the model: the longer the better. About 25 feet of good nylon fishline should be enough. We use a small snap or control-line hook of some kind to fasten our line to the model.

For your first flights, select a calm day and a flying site covered with long grass to cushion any hard landings. With about two or three feet of line extended, and the plane held off the ground, begin to turn in a counter-clockwise direction. Centrifugal force will immediately bring the plane into an upright position. Now pay out about 10 or 15 feet of line slowly. Once you get the feel of it, try raising the tip of the rod to make the ship climb, lowering it will make the ship dive. By turning more slowly, the ship will slowly lose altitude and with a little practice you can slide the ship in for a belly landing if the field is smooth, or if you prefer, the line can be reeled in instead of making a landing.

Once you get the feel of the ship you can use more line but be careful not to let out too much or you may lose control of the plane. Once you've gained experience try balloon bursting or combat.

With no balky motors, no messy fuel, and no noise to bring the neighbors' complaints, you'll have plenty of good flying.

Indoor R.C.

(*Continued from page* 19)

much stronger than is necessary when you get down to these light weights—it even flew right into the trunk of my car one day, banging the structure in several places without damage.

Another point; with a pusher, the engine would be in back and forcing the exhaust back as well—so let's go to a profile job and let everything hang out in the breeze. Finally, let's go really indoor in the design concept, with a single-surface wing.

So, I laid out the design and built an entirely new model. I went back to the Bonner SN escapement, but here I got tricky. I cut off one of the neutral stops, and thereby had a compound escapement. Of course it presented the problem of how to get the second position, since there was no governor, but by using 1/16 inch rubber (plenty powerful for the job) I found that the rotation speed was slow enough that with some practice I could get the proper command. This return to the SN escapement also saved weight.

When the model was finished, I covered the wing with Jap tissue, and then made my mistake. I didn't plasticize the dope enough and when the covering dried after the first coat, the airplane was named "Warpy." I should have used the same size wood for the leading and trailing edges, but I didn't and the trailing edge really warped up. This gave me a lot of washout—more than I wanted, but I figured it would be all right to experiment with, so I finished up the model, fuel proofed it, and took it out early one morning to test in calm air.

This model proved to be a truly named indoor job. It weighs 3¾ ounces, has a 33" span, 7" chord, and flies slowly enough that you can run alongside of it. Don't try it, though, unless you've checked your transmitter-receiver combination to be sure the receiver isn't swamped when the transmitter is too close. The model is adjusted to fly in a 30' circle to the left. By pressing the button on the transmitter once, right rudder pulls the airplane slowly into straight flight and then into a gradual right turn. If you can't beep fast enough to get the second position, which is left rudder, you can still fly around indoors and have fun, just by using the adjustment mentioned

above. If you can get the second command, the left rudder makes the model turn sharply to the left and nose down, and this is the way to get altitude control and keep from hitting the ceiling.

"Warpy" is what I would call a sort of "laboratory" model. It does the job, but it isn't much to look at. But it does point the way, and for you experimentally minded modellers, it isn't too hard to make a few refinements to the design and come up with a really attractive indoor R/C job which you can fly in the local high school gymnasium (get the principal's permission first!). For example, make the boom hollow, and run the torque rod through it—maybe close in the cabin area with a light shell of balsa. You probably already have an idea or two of your own, so go to it, and let us hear how you make out.

Foreign Notes

(*Continued from page 2*)

60 ship spun in at full bore from 500 feet. Eventual winner was Geoff Tuck with a large Max-29 powered model.

WEST GERMANY

As reported in our January column, the 1959 World Championships winning East-German Schlosser engine went out of production when designer-manufacturer Benno Schlosser left the East to settle in Federal Germany. Having worked for a short time in the Volkswagen plant, Schlosser has now become re-established at Knittlingen/Wurttemberg. Here, in partnership with Klaus Krick, son of an East German publisher and kit manufacturer, he has founded the firm of "Modelltechnik Knittlingen."

Unable to bring the dies for his .06 and .15 cu. in. engines from East Germany, he has commenced production of an entirely new Schlosser engine, a diesel of 0.5 c.c. (.030 cu. in.) displacement. The motor, which is a shaft-valve unit, looking somewhat like the British D-C Merlin .046 externally, has a bore and stroke of 0.3346 x 0.3465 in. and weighs approximately 1.2 oz. Karl-Heinz Denzin, well-known German model designer, tells us that the motor will turn up 11,200 rpm on a Tornado Plasticote 6/3 prop—which is pretty good for an .03.

JAPAN

The Japanese model firm of Oishi & Company of Takatsuki-cho, Ika-gun, Shiga Pref. have just introduced a new clockwork timer called the "Kopil." We have received a sample and it seems to be very good—as, in fact, it would have to be, to compete with the Tatone, KSB and Japanese-made timers now enjoying popularity with free-flighters in numerous Western countries. The Kopil is similar in layout to the KSB, etc., but instead of having a fuel shut-off valve, a snap-action squeezed fuel-tube system is employed. Timing is 0-20 seconds, with on-off switch and a dial graduated 5-10-15-20. Mounting plate dimensions of the timer are 1-9/16 x 1-3/16 in., the movement being 9/32-in. deep. The complete timer weighs approx. 0.8 oz.

HUNGARY

This year sees the world's first International contest for indoor (microfilm) models. As agreed at the last FAI Models Commission meeting and reported in last month's column, the event will be run by the Central Aero Club of Hungary to rules suggested by the U.S.A., Great Britain and Hungary. There will be two classes: for models under 35 centimeters, and over 35 centimeters (13.78 in.) span, respectively. The contest will take place in the 100 ft. high hall of the University of Medical Science at Debrecen, 125 miles from Budapest, on May 17.

SOUTH AFRICA

From "Wipmac", bulletin of the Western Province Model Aircraft Club, we learn that Johan DuToit's Twin-Nobler stunt ship boasts two Fox 35's and has done everything, so far, except an hourglass. Inside motor has a two degree offset; outside motor seven degrees. A trifle tricky, at present, to get both motors running evenly, but model will fly well on either engine. Entire model is sheet covered, is finished in attractive blue and white color scheme and weighs four lbs., including four oz. nose ballast.

CUBA

For the past couple of years we have had little to report from Cuba. Apparently, modeling there fell into the doldrums: partly because of the withdrawal of some model flying facilities with the worsening political situation; partly because of a boycott, on some official contests sponsored by the late Batista government, by modelers sympathetic towards the former rebels. Now, however, we have a letter from our old friend Tony Alvarado in Havana, in which he tells of enthusiastic new plans to re-establish organized model flying in the island. New flying sites, open to everyone and suitable for all types of model flying, are being planned and it is hoped that Cuba will be able to compete in Inter-

(*Continued on page 54*)

THE BIGGEST NEWS SINCE THE ADVENT OF THE GLOW PLUG!

GLOW CHECK

(Pat. Pend.)

PRESS TO TEST!

Checks Any Glow Plug in Seconds
without removing plug from engine.

CHECK BATTERIES TOO!

One's first concern in starting any glow plug engine is the glow plug... is it good? This can be answered in 1 second with the "GLOW CHECK." Press to Test. "GLOW CHECK" tells one immediately whether the plug is good or bad. Simply attach "GLOW CHECK" to battery and fasten glow plug battery clip in usual manner—press indicator light which lights up if plug is good.

The "GLOW CHECK" is left on battery at all times — ready for instant use. The "GLOW CHECK" also indicates when battery is becoming weak. The indicator light will merely glow faintly showing it is time to REPLACE BATTERY.

Works on any 1½ or 2 volt battery • No longer necessary to remove plug

Saves time—a must for all types of flying • Install in seconds

Easy to use—press to test • Ready for immediate use on any glow plug

The advantages of the "GLOW CHECK" are even greater in engines where the glow plug is part of the head. Many engines of this type have been damaged in the process of dismantling to check the glow plug. They need never be taken apart for this purpose when a "GLOW CHECK" is used.

IF IT LIGHTS — PLUG IS RIGHT!
FAINT GLOW — BATTERY LOW!

Only
$1.49

"GLOW CHECK" is to be left on battery at all times.

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ACTUAL SIZE

national events in the not too far distant future.

IN BRIEF . . .

England . . Eta Instruments Ltd., who, during the past year or so, have been back in the racing engine business with a new version of the Eta 29, have now reintroduced their 19, with improvements. Claimed output is 0.43 bhp at 15,000 rpm on 40 percent nitro, which, if substantiated, means an improvement of about 30 percent over their original 19 and, possibly, the most powerful Class A engine in current production. Also in the course of development is an RC version of the 29. Italy . . Expected soon from the Super-Tigre factory is a .50 cu. in. motor for overweight Astro-Hogs, deBolt Bipes, etc. (K&B .45 already on market—Editor). Engine will probably use certain Super-Tigre G.24 (.60) parts, having similar stroke, but sleeved to .50 displacement and with front rotary intake designed for proprietory throttle units.

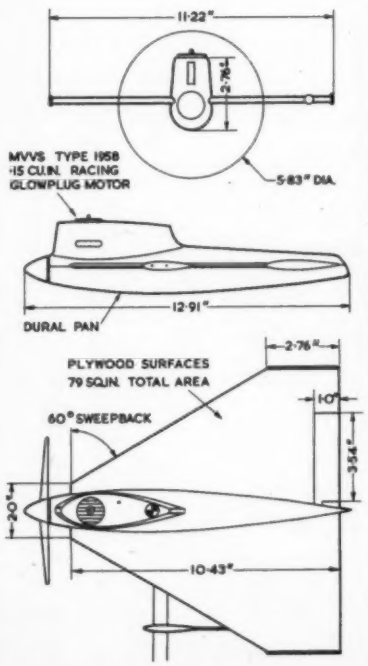
The SE-5

(*Continued from page* 11)

Cut slot on top side to admit axle. Cover unit with silk.

Wings: The wings are built in four panels, two left and two right. They are identical in construction except for dihedral brace boxes and rigging hooks which are on the top wing. You will also note that the strut retainers are on the top of spar on lower wing, and bottom of spar on upper wing. On lower wing the strut retainers will have to be blocked up to be flush with wing surface. Ailerons may be omitted if desired by replacing W-4 and W-5 ribs with W-3 ribs. The W-2 and 1/16" ply end ribs should lean inward five degrees to allow for dihedral angle. Build the 1/16" sheet boxes with the 1/8" ply dihedral

(*Continued on page* 56)



F.A.I. (WORLD CHAMPIONSHIP CLASS) SPEED MODEL
BY: FRANTISEK PASTYRIK – CZECHOSLOVAKIA
4TH. PLACE, 1958 CRITERIUM D'EUROPE – 128·006 MPH

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brace in place to assure a tight fit. (Do not cement braces.)

The top wing center section is 1/16" sheet covered on the top surface only and silk covered on bottom. The bottom wing roots are 1/16" sheet covered on the top and bottom. Wings and roots are then silk covered.

Rudder and Fin: Entire construction is of 1/8" sheet; the ribs are 1/16"x 1/8". Mark off where the rigging wires go through fin and insert small dia. aluminum tubing and sand flush. Make two aluminum hinges, insert where shown; cut a slot in fuselage block to accept lower hinge. Cover with silk.

Stabilizer: The stabilizer is built in two halves which makes transportation and repair easy. The movable elevators may be omitted; however, their flexibility makes final flying adjustment easier. Before covering make sure the 1/8" dowels align properly with the 1/8" aluminum tubes in fuselage.

Assembly: Perhaps the one most important assembly on this model is the proper angular setup of the top wing. The lower wing and stabilizer are automatically aligned by the slots and tubes. This is the method I use and find it quite accurate.

Carefully trace off on the plan sheet the area between the bottom of the top wing and the top of the fuselage. Cut a template out of 1/8" sheet of this area and pin to top of fuselage. Slit the silk covering of the center section along the spars to accept the wire struts and slip down until flush with your template. When parts seem to fit well, mark off the wire where the rigging hooks go, then remove center section and solder hooks to wire struts.

Run a ribbon of cement up into slits and replace onto struts. Check alignment carefully and allow to dry thoroughly. Force a strip of hard 1/16x1/4" up into slots and cement in solidly, then sand flush. Add the 3/32x1/4" strips to wire and wrap with silk to complete the center strut assembly. Cement bottom wing roots to fuselage sides. Cement rudder in place. Make shutters and paint them with aluminum dope. They are built to allow the air to flow between them.

The wheels can be built satisfactorily without the use of a lathe, and they are very strong. The model bounced very hard on the gravel filled runway at Glenview N.A.S. and the only damage was pieces of gravel pocking the balsa tires which was easily filled and repainted black. Not a bad price to pay for scale wheels. Build up the remaining details such as gun mount, machine guns, sight etc.

Finishing: The entire model was given four thin coats of clear dope and two of color. Add the trim and markings. My SE-5A bears the markings of No. 85 SQDN. RFC. Additional SE-5A SQDN. markings were published in June 1947 M.A.N. Paint, then cement machine guns and other details in place.

Rigging: Slip wings and stabilizer into place. The 1/8" ply dihedral braces are not cemented but can be completely removed. On one flight, the model hit the ground so hard that two of the braces actually sheared clean; it was a simple matter to slip in new ones and resume flying.

The landing wires are added first. They are rigid and secure the dihedral angle. Loop the ends of the wires to engage hooks; do not solder looped ends so they can give on impact. Rig with the interplane struts in place. Your top wing will automatically assume the proper angle. All the flying

(*Continued on page* 58)

AMBROID & SCIENTIFIC – TERRIFIC!!

Back on June 6th, 1928, John D. Frisoli successfully flew a Baby R.O.G. model for 132 seconds, to gain one of the coveted Honor Certificates awarded by the "Airplane Model League of America". John — who is now President of the famous Scientific Model Airplane Company — used Ambroid cement to build this model, back in the old "Spruce 'an Bamboo" days. "It was difficult 30 years ago" — says John — "to secure satisfactory materials for model plane building. Balsa was scarce and covering materials were often poor, but at least we had the same fine Ambroid cement which is available at hobby dealers today. For building Scientific Models, we suggest that model builders always ask for Ambroid, the best cement that money has ever been able to buy!"

Scientific's John Frisoli and three new 'Ambroid-built' prototypes — Cessna 172 (top), Thunderbird (left) and Piper Cub Rescue Plane (right)

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wires are rubber band loaded. These rubber bands also keep the struts from slipping out of the retainers. Add all remaining wires as shown on plan.

Flying: With model completely assembled and with the prop on engine make certain the model balances where shown. Add weight to nose or tail end as needed.

With the set-up shown, my model swings a 10-3½ propeller and weighs in at 30 oz. ROG's are long and satisfying, taking about 10 feet to raise the tail and about 30 feet to lift gently off the ground into a shallow left climb. Glide is straight. The model flies best in calm conditions. If a lot of windy weather flying is expected, try a .15 but be careful of overpower.

Adjust for a smooth glide. Slight compensations can be made with elevators. Once a good glide is obtained make all your power adjustments with engine offsets alone. If the model seems to drag her tail as if under powered, keep adding turn a little at a time until corrected.

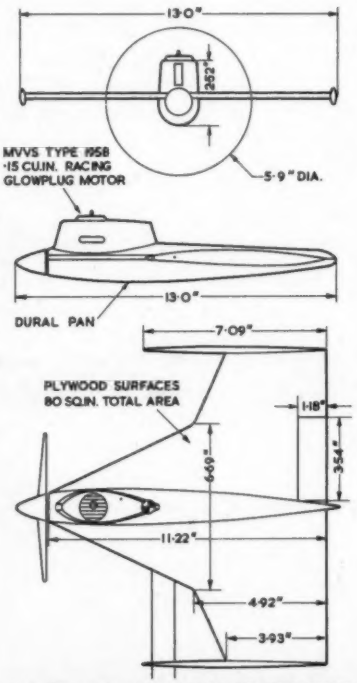
If at all possible, make your power flights from a take-off position. Proper tracking and any unstable tendencies can be spotted before she gets away. Caution and patience should prevail, think before each flight, and do not try to adjust your model when it's windy.

Pop It!

(*Continued from page* 14)

in rainy weather is another. A celluloid shield over the fuse is helpful under such conditions. Don't think it odd to use a dethermalizer when it is raining, as there still may be thermals present.

Another cause of failure is using too large a rubber band, requiring it to be wrapped many times around the hooks, and snuffing out the fuse before it severs the rubber band completely. Hooks too closely spaced will require any rubber



F.A.I. (WORLD CHAMPIONSHIP CLASS) SPEED MODEL
BY: JARDA KOCI – CZECHOSLOVAKIA
3RD. PLACE, 1958 CRITERIUM D'EUROPE 129·864 MPH

band, large or small, to be wrapped around many times.

Note that we show a limit wire instead of a limit string. When using a string, there is always the danger of it becoming tangled in the fuse and getting burnt. Some modelers prefer to use braided Control-line lead-out wire. We prefer to use solid wire of about .012—.015 diameter because it helps in pushing the tail up. Very helpful if the keys are a bit too tight fitting. You must use a small rubber band to hold the lower end of the wire on the lower hook. The other end is placed on the upper hook before the stabilizer hold down rubber is pulled down over it.

Don't forget to use a snuffer tube on your dethermalizer installation. A smoldering fuse falling on dry grass or leaves is very dangerous. In fact, fuse-operated dethermalizers are outlawed in some parts of the country. When the fuse burns down to the tube, it is snuffed out due to lack of oxygen. Select a piece of thin wall aluminum tubing with the inside diameter to match the outside diameter of the fuse. Build it in as part of the fuselage, or if the plane has already been built, the tube can be cemented under the stabilizer platform against the fuselage.

Some modelers don't like the idea of pulling down the stabilizer hold down rubber band back around the rudder. They are afraid that the sometimes delicate rudder adjustment may accidentally be bumped. To avoid this they use a forward hook, even on the rudder-mounted-on-stabilizer arrangement. (Fig. 2) Sometimes a wooden peg is used in place of a wire hook. Some modelers have carried this set-up a step further and let the peg extend through the stabilizer and into the stabilizer platform. The peg is used now as a key to help maintain a perfect rudder alignment. By slotting the stabilizer platform the key acts as a pop-up stopper and eliminates the use of a limit wire. See Fig. 3. On this arrangement be sure the peg or key is firmly cemented in the stabilizer. Preferably mounted between two center ribs and always against the leading edge. The platform must be reinforced at the rear of the slot or in time it will wear and tear out.

Fig. 4 shows the arrangement used on ships with an inverted rudder. Since the trend at the present in free-flight gas seems to favor the hi-thrust model, this arrangement will be helpful because almost everyone of these hi-thrust designs features an inverted rudder. We show a forward hook for the stabilizer-hold-down rubber band although some modelers prefer to anchor the rear hook solidly and pull the hold down rubber band back to it. A limit wire

Complete Listing

MODEL AIRPLANE NEWS FULL SIZE PLAN SERVICE

The editor's selection of all time favorites, including completely new combinations of the greatest designs. All types!

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PLAN OF THE MONTH

58. SE-5: FF, .09-.15
PIED PIPER: Rat Race, UC.
½ WAVE: RC, .049
SE-5 most beautiful flying scale model ever published. ½ Wave, popular re-run.

4. SURE FUN: UC Sport, .29-.35
PROFILE SILVAIRE: FF Profile, ½A.
ZEPHYR: Rubber, Fuselage
Control line on floats. Sport Gassie.

6. HIGGINS CABIN CRUISER: RC Boat, .09-.19.
FOKKER D7: Scale, U/C, .29-.51.
The great all-time favorite? Try the Fokker D-7.

7. WORLD CHAMP GL.: Nordic Winner.
HI BOY: Cabin Stunt, Palmer-Goyet, .29-.35
POW WOW: Bob Palmer stunt, .29-.35
Collector's item—two Palmer models!

9. AEROCOM'DER: Scale, U/C, 2 .15.
MARS: Bob Palmer stunt, .29-35.
NOBLER: Aldrich's Nats Winner, Stunt, .29-.35. **Palmer and Aldrich, plus a twin ukie. Imagine!**

10. SMOG HOG: Bonner's Multi RC, .19-.35.
STRATOLINER: 2 Half A, U/C.
GUARDIAN: U/C Scale, .29 up.
Greatest Multi RC of all time—a beauty!

11. GAMBLER: Mirror Stunt Winner, .29-.35.
DOUGLAS B-66: ducted fan FF, .049.
B-66, the ducted fan job that beats all others.

12. WHIRLING WINGS: Sikorsky XH-5, .15, 'copter.
BREEZY: Small field RC, .049.
SPITFIRE: Stunt, semi-scale, .29-.35.
P. Schoenky, 'copter master-his Sikorsky!

13. T-CRAFT: FF scale, .049.
FENO: Combat, stunt, .29-35.
PADDY'S WAGON: Contest FF, .049.
Paddy's Wagon—one contest job ok for beginner.

14. HEATH PARASOL: RC, FF, Scale, .075 .09.
GUARDIAN: Nats carrier winner, .29's.
SHARPIE: FF Sport, .02-.049.
—Guardian a dilly.

15. RE-8: WW1, U/C. .29-.35.
FLAPPING WINGS: Rubber, ornithopter.
BOOMER: FF, sport, pusher, .049.
Can planes fly like birds? Ornithopter sure does.

18. PAACKHORSE: PAA Load FF .15.
AIRNOCKER: Scale, FF .049.
What model hit the jackpot? Airknocker—the Champ.

22. MOONEY MITE: ½A Scale FF.
'55 RAMBLER: .29 Team Racer.
WACO CABIN: ½A FF Scale
The Mite, stable, real looking low winger. Rambler still beats 'em. Waco—Cute!

40. MUSTANG: U/C Scale, .29.
BI-GONE: Sport, FF, ½A.
GLIDERS FIVE: HL Sheet.
Mustang, Jim McCroskey's Nats winner. Bi-Gone, nifty bipe.

43. EQUALIZER: .15 to .19 multi, RC.
QUICKIE TRAINER: Speed, .29.
AMAZOOM: FF, contest, .15.
deBolt's best, the Equalizer? Amazoom—Stan Hill's hi-thrust.

44. CONVAIR'S DELTA: Jetex FF.
LIL DYNAMITE: .15 stunt, UC.
SWAT: ½A, FF, contest.
A trio of exceptional planes.

46. PROPJET B-47D: U/C, .15's.
RUFFY: Stunt, .29-.35.
NOR'EAST'ER: Nordic glider.
B-47D, beaut of a project
Ruffy: big winner—it's new!

47. FOKKER E-3: 1/2A, FF, Scale.
NAVY RACER: Rubber, semi-scale.
WOODY: .29-.35, UC Combat. Hot!
E-3, beautiful model, fine flier.

48. SPORTCOUPE: .09, U/C, Stunt.
WHATIZIT: .35, Combat, Wooten.
SWIF-F-FT: Jetex, two sizes!
Whatizit, settles fuse-wing debate!

49. CONQUISTADOR: .29-.35, U/C Stunt.
TWO-STAGE ROCKET: Jetex (2).
Stunter is a thing of beauty, and it flies as well as it looks!

50. DUMBO: PBY Scale, U/C, .19's.
FRENCH OLDTIMER: 1914, ½A, FF.
Dumbo, the Catalina, man-sized ukie, takes off, lands on water or ground.

51. AMERICANO: .15 FF, by Blanchard.
BOMARC: Scale, Jetex, missile.
CUTLASS: Sport U/C, .049's.
Scorpion power makes Bomarc terrific flier. Americano is National Champ's very latest.

52. GAUCHO: RC Stunt, .29-.35.
THE CHAMP: Best U.S. Wakefield.
LAIRD SOLUTION: U/C Scale, .15-.23.
Gaucho, Argentine Champ, does pattern inverted. Champ, a single Wakefield!

53. SNAP: Sport U/C, .19-.23.
PELICAN: PAA Cargo, .049.
WINDMILL: FF, 'giro, .02-.049.
For proto take-off and landing realistic Snap tops 'em all. Other two, collector's items.

54. SATELLITE: Hunter's FF, .19-.35.
SUPERMARINE S-6B: U/C Scale, .09-.15. Satellite is top contest free flight '58-'59. Schneider racer, S-6B seaplane is one of FAST club's best projects.

55. DETROIT STUNTER: U/C .29-.35.
HORNET MOTH: FF, Scale, .02-.049.
THE BARDON: Wakefield.
D'troit St.: McDonald's Strathmoor, Nats favorite. Bardon: Canadian and US Nats winner, tops in rubber.

56. RYAN PT-22: U/C, .19-.25.
SNIPE: Gurnett's Nordic.
Lovely scale job, that PT, with workable flaps, throttle.
Tow-line glider long, strong wing, right sections, etc.

57. Twin Lizzie: 1/2A FF.
Com-Bat: U/C, .29-.35.
Fireboat: Marine, RC.
T-Liz, a cute sport job.
The boat, Musciano, a beaut.

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1. Gimlet RC, Royano FF.
23. Humdinger, Old Faithful, Cessna 180
24. Aero Bat, Snoopy, Seagull
26. Corsair, Gyro-Glider, Santanita
29. Cougar, '55 Nordic Winner, Dizzy Boy
30. Great Lakes Trainer, Triple Threat RC
32. Mig-15, Fifinella, Coquette
33. Skyraider, Dunwoody's Nordic, Flexi-Bull-It
34. Corben Super Ace, Cessna 310, Profile Lightning
38. SE-5 (RC), Curtiss Robin FF, Nobody (Com.)

also must be used with this type of installation. Be sure that the rudder is reinforced properly on this type of model as it is the first part of the airplane to make contact with the ground.

In Fig. 5 we have shown two arrangements which also eliminate the limit wire. The first is used when the rudder is mounted in the fuselage forward of the stabilizer. Use the same type of hook arrangement as you would on the inverted rudder assembly. The other arrangement is usually used on rubber models which have large rudders. Both types work equally well.

Fuses are almost always treated to insure that they have an even burning rate and don't snuff out in flight. The only type of untreated fuse we know of is sold by Sig Mfg. Co., Montezuma, Iowa. It is graduated, ready to use and reliable. The other types of fuses used are purchased at any 5¢ & 10¢ store. Plain old cotton clothes line or venetian blind cord! There are two kinds of indoor clothes line that can also be used. One is braided with a solid cotton center and the other is a twisted cotton cord. The latter unravels slightly when cut, so care must be taken if you use it. It is the cheapest of all and is therefore widely used. Soak the fuse material in a potassium nitrate solution and then allow to dry thoroughly before using. You can buy potassium nitrate at the drug store. Use one part to three parts of warm water. This will dissolve it quickly. The small rubber band we use to hold the rear of the stabilizer down is a No. 8 rubber band. You can buy these at any art or business supply store. A quarter pound box costs about a dollar and is practically a lifetime supply.

Within the last year or so a clockwork timer has been introduced for dethermalizer use. It is the Tatone D. T. Tick-off timer. It is light (¼ ounce) and very dependable. Fig. 6 shows the type of installation recommended by the manufacturer which is simple and foolproof. The action is self explanatory. Be sure the aluminum tube at the rear is curved. No sharp bends here! The rubber band we use is a No. 8 band doubled. The arrangement shown is that used on planes that are already built. A new plane could be built to have the cord running inside the fuselage from the aluminum stop to the rear. We do recommend that the cord be protected in some manner. We use a hardwood angle strip of the type used for building structures on model railroad layouts. Ask your dealer.

This article wouldn't be complete without a few words on the proper operation of the dethermalizer. For sport flying we usually guess at the length of the fuse needed to keep the plane around. But at a meet you must know exactly how long the fuse will burn. It may mean the difference between winning or losing. Before flying, cut a length of fuse and time its burning rate. Twirl the fuse around to simulate it moving thru the air as it would on a plane. After timing, cut your supply of fuses for the whole day. Cut a couple of extra for delayed or unofficial flights. We say cut them before you fly to keep down the number of times you must handle them with oily fingers. Carry a pencil in your tool box so you can graduate the fuses at intervals of a minute or 30 seconds. Of course, if you use a timer you don't have to bother with all this because you would have previously marked the timer at home as per the manufacturer's instructions. The timer is very accurate because it doesn't vary with different climatic conditions as does the burning rate of a fuse.

The subject of dethermalizers is very confusing to the beginner and we hope that we have, through this article, helped those readers who have requested such information and that this article may be of value to them. If there are any further questions, the author will be glad to answer them if you write to him in care of this magazine.

As we go to PRESS

► 1959 Nationals: Will be held at Naval Air Station, Los Alamitos (Long Beach), Calif., July 27 through August 2.

* * *

► State Championship Fund: Hobby Industry Association has underwritten the cost of sending 50 state champions to the National Contest. An eliminations system will be established by the time you read this.

* * *

► 1959 Mirror Meet: Seventeenth Annual Mirror Flying Fair, to be held at Floyd Bennett Naval Air Station, Brooklyn, N.Y., on August 29.

Radio Control News

(*Continued from page* 21)

would be excellent. On the other hand if it requires an extra stage of IF plus space and weight, we see no real advantage in it. The Citizen-ship superhet circuit is designed with an RF stage to provide good image response and uses RCA drift transistors in the RF, oscillator and first detector stages. We have heard of some work being done in attempting to consolidate the oscillator and 1st detector stage in order to use but one transistor. So far this has been only an attempt and we doubt if the extra cost of a transistor justifies this design. The 8-channel equipment uses the same basic superhet front end and varies only in the value of two resistors in the IF stages, in order to make it work on 15 instead of 9 volts. Higher voltage was needed to drive reliably the reed bank and auxiliary relays. Any extra weight is partially compensated for by reduced battery needs.

Citizen-ship has done the "miniature" modeler a favor by building the 3VTR receiver. A relay was used in this model so that a variety of actuators could be used, types that would use the NC contact of the relay. However, the relay may be taken out and the receiver is perfectly capable of driving an escapement directly. Currents as high as 400ma can be drawn through the transistors. This means that the receiver, escapement and batteries could be held down as low as 2.5 ounces. Regarding the transmitter frequencies supplied (27.045 and 27.145mc), this was done so there would be a maximum separation between all frequencies used, Babcock supplying transmitters on 26.995mc.

• • •

All of the superhets we have heard about are using an IF frequency of 455kc. As such, quite a few miniature and subminiature IF "cans" can be purchased without resorting to specials or home-made units. Most of these measure ¾" square and some in the works, from various manufacturers, are 5/16" square. For a complete description of a superhet circuit we suggest you obtain books from your local library or get a copy of the Radio Amateur Handbook. Basically, the incoming frequency is beat against a local oscillator frequency to obtain the difference of 455kc, which is then amplified. Also, all sets we have run across so far have had the local oscillator operating on the low side of the incoming frequency. This gets us away from possible trouble and interference on the other side of the high end of the band, 27.255mc. Receivers can generally be made broad tuning to the point of changing frequency merely by changing crystals. Slight retuning might be necessary in going from 26.995 to 27.255mc. Local oscillator crystal frequency is merely the signal frequency minus 455 kc. For example, on 26.995mc you would use a receiver crystal of 26.540mc and, on 27.255mc, you would use a receiver crystal of 26.800mc, assuming an IF of 455 kc. The ball is rolling as far as superhets are concerned and eventually everyone will be using them. On the other hand you do not have to give up getting non-superhet equipment or using it, if you have no interference problems and if the flying line isn't too long. Incidentally, the Kraft receiver presented in the March issue of MAN is unusually selective and two units have been operated within our present allotted frequencies with no trouble.

• • •

From Herman Hanyes, 8817 Bridgeport Avenue, Brentwood 17, Mo. comes Figure 1, showing his modified Bonner servo for aileron use. It also can be used for elevator and front wheel-brake control. The only real machining consists of boring a #51 (.067" diameter) hole through the 6-32 screw. This is done in a lathe, coming in from both ends. End fittings for the 1/16" push rod are made from brass or steel and silver soldered to the push rod. Note the "T" bar end screws into the nylon. This now prvides a double-ended servo. Cut servo cover to clear pushrod.

The articles in MAN about endurance RC flights have encouraged many others to do the same. Tom Williams, of Oklahoma City, Okla., has made two practice hops of seven hours each and is shooting for 12 hours. If he can make 12 hours, he'll make an official attempt. Should be good country for this work in the middle west and we wish him success.

Carl Lindsey and Bud Atkinson of the KC/RC Club demonstrated a positionable control system developed by an electronic engineer. The system follows carded cues, ala "electronic brains" and the fascinating part is that it is transistorized and drives a 1.5 volt servo. The servo can be driven to any degree of throw and returns, on signal, to exact center.

• • •

Down in the Washington, D.C. area, Walt Good continues to take the boys in pylon racing. In spite of a stiff breeze several months ago Walt took 1st with 34.1 mph followed by Al Montzka with 30.4 mph, and Don Clark with 29.6 mph. Windy weather pylon flying shows up the real advantages of systems like the WAG and Simpl/Simul.

• • •

Mr. Donald Sump, of Sheridan, Wyoming, the generous gentleman who feeds RC fliers genuine western steaks, is holding his get-to-gether on Memorial Day. Don mentions that outside of the Nationals, the RC judging leaves something to be desired. We have noticed this also and, rather than get into a big discussion, would like to mention that good judging is everyone's responsibility. It is a tough job and people being what they are, there are bound to be differences of opinion. Anyway, Don will have two trophies, one for the "best average" spot landing and one for manuevers. Most flying out that way is rudder only and hand launched. The manuevers event will consist of eight passes directly over the transmitter, coming in from the north, east, south and west, two times each. Sounds like a novel event for rudder only flying.

• • •

RC'ers in the vicinity of Ottawa, Ill., will be pleased to learn of the forming of the Illinois Valley Radio Control Club started December 10th. They plan a newspaper entitled the "Illinois Valley R.C. Roundup" and dues are 50 cents a month, with a $3.00 initiation fee. For information, contact Howard Halm, 920 West Main Street, or Marvin Doucey, 600 Arch Street, Ottawa, Ill.

• • •

With the increased activity in the 27mc area, it behooves everyone to properly fill in and submit form 505 to the FFC. Be sure to get a copy of Part 19, Citizens Radio Service, and study it. (Required before you can fill out form—Editor) There should be no excuse at least for clubs and other groups not to be familiar with this document. Be sure to comply with Conelrad requirements. This can be

done by taking a portable radio to your flying site. You can either tune to the Conelrad frequency of 640 kc or 1240 kc and leave the set alone, ready to pick up a broadcast, or, listen to any station you choose until it goes off the air unexpectedly. In this case, you immediately retune to the Conelrad frequency/s and listen for instructions.

• • •

December 7, 1958 proved disastrous for the Pioneer Radio Controllers. Bill Stelmach and Karl Peters had a mid-air collision, there were several fly-aways, a few out of control flights and a few lucky ones who just didn't get in the air due to mechanical or radio troubles. We hope this bolsters up other fliers around the country who can see the advanced and expert fliers have their problems too. Quite a few scale jobs being built by this group.

• • •

The Aerial Robots of Modesto, Calif., are in the scale field with a maroon-and-white Pitts Special Bipe (Fox 19, Citizen 27 and dual Varicomps RME) by LeRoy Hamner and a Schneider Cup job (Orbit 8) by Otto Lion. Bert and Wilbur Galeria and Les Farmer may have a solution to the sticking Bonner servo problem. They replaced the ball bearings by a piece of ¼" brass tubing, pressed into place. No hangups since they have been using the modification. Glenn Carter really dresses his models up by installing a pilot from one of the Aurora AF Pilot kits.

• • •

The Second Annual RC Symposium sponsored by the DCRC and AMA will be held on Saturday, April 11th at the Perpetual Building Association, Bethesda, Md. Among the speakers who will give talks geared to the average RC builder are: Woody Blanchard, aerodynamics of RC models; Maynard Hill, metallurgy for RC; John Worth, Simpl/Simul; Larry Herzog, feedback applied to dual proportional; H. G. McEntee, RC transmitters and antennae; and Hal deBolt, RC engines. Displays of new commercial and home-made equipment will be made and a church supper will be served Saturday night at $2.00 each, a special rate for children. Sunday there will be flying demonstrations. These will be comparative demonstrations to help the onlooker decide which control system he should use. Motels are available in the Bethesda and Silver Spring, Md. area, the symposium fee is $2.00. The Cherry Blossom weekend is on for the wives and family and additional information can be obtained from George Wells, 10004 Thorwood Drive, Kensington, Md.

• • •

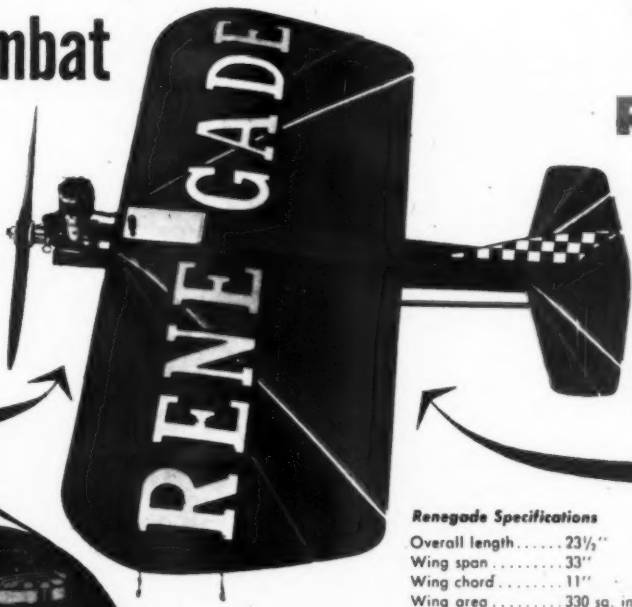
The Peoria RC Tattler (Bax 1235, Peoria, Ill.) tells of their members paying $200.00 on the Washington Model Airfield site. From the sound of it, it appears that the members paid $200.00 apiece, which makes this quite an active club. The controversy of flat rudder tab vs streamlined section was answered for them by Walt Good in favor of the flat tab for pulse work. Don Dickerson is working on a new proportional servo which is said to be a work of art. The Peoria club gives data on the penlight size cell made by the Gould Battery Company. Size is the same as a pencell with a nominal voltage of 1.25v and a capacity of .45 amp/hour. The short-circuit current, right after charging, is 8 amps and the cell will fit a conventional battery holder. List price is $3.00 and while we have no first hand information on this cell, it sounds

(*Continued on page 66*)

Veco's answer to combat

VECO

RENEGADE



Designed to maneuver like a hellion, the all-new Veco Renegade combat plane out-fights, out-speeds and out-performs all competitors! Rugged durability and simplicity of construction make it a favorite with all modellers. Pre-fabbed kit...

list price **$3.50**

Renegade Specifications

Overall length	23½"
Wing span	33"
Wing chord	11"
Wing area	330 sq. in.
Engine mounting	Upright

Veco .35C Combat Engine

A real package of power that's specially built to take the gruelling punishment of combat and rat-race flying. A new extra heavy heat treated crankshaft absorbs the strains of violent maneuvers. Improved high speed porting gives top rpms and thrust. Special fitting taps crankcase pressure for use with pressure fuel tank.

list price **$16.95**

Convert your present Veco Engine

For Pressure Fuel Injection Any 100 Series .19, .29 or .35 Veco engine can be converted to pressure fuel injection with a Veco pressure fitting. Easy to install.

list price **50¢**

A Sure-Kill Combination

Combat experts have been aware of the need for a new fuel system capable of meeting the demands imposed by today's highly maneuverable combat planes. They know that suction fuel systems, which permit fuel to be pulled away from the engine during certain severe maneuvers, are responsible for most speed-killing engine sag—frequently blamed on the engine itself.

Veco's answer is an entirely new pressure injection fuel system that forces fuel under pressure to the engine regardless of plane attitude. With constant fuel supply, engine sag and loss of rpms is eliminated. Power is instantly available to give you the edge you need for sure kills in competition.

For Fighting Ace combat flying the champion-making combination is the new Veco Renegade equipped with a Veco Combat 35 and Veco Pressure Fuel Tank. They're made to go together!

Veco Pressure Injection Fuel Tank

Here's the first true pressure fuel tank especially designed for combat and stunt needs. New longitudinal baffle, developed after more than two years of testing, keeps fuel under pressure to the engine at all times. Power failure and engine sag due to surging during maneuvers is completely eliminated. Available in 5 sizes, from 2 oz. to 4 oz. *list price* **$1.45**

A proven winner

Designed by John Barr of Los Angeles, and formerly known as "The Butterfly," the Veco Renegade has been contest proven. It is one of the top combat winners in Southern California.

Ask to see the Renegade at your hobby dealers!

VECO PRODUCTS CORP., BURBANK, CALIFORNIA • Veco Products are sold by leading hobby dealers everywhere

perfect for some of the 1/4A jobs.

• • •

The Central Jersey Radio Control Club News advises that they held "Operation Rolling Breadboard" on February 10th. This event was limited to electric-powered cars which had to run a slalom course, the minimum radius turn of which was 36". Winner was determined by time required to complete course. Anyone in the Central Jersey area who is interested in this club can contact Mr. John Trice or W. R. Staats, YMCA, 518 Watchung Avenue, Plainfield, N.J.

• • •

ESSCO RC Products, 58 Walker Street, NYC stocks the much talked about Minitone electric motor. This unit is extremely low drain, considering the power and efficiency, and is smooth running. The SRM model lists at $2.95 and by the time you read this, ESSCO may have their kit of motor, bracket and gears ready for $5.95. Also available from ESSCO is a new 12-volt vibrator supply for transmitter use, selling for $11.95. Suitable for use directly from your car battery or two NT-6's, the drain being but one amp.

• • •

From the surplus market you can contact the J. J. Glass Electronics Co., 1615 South Main Street, Los Angeles 15, Calif., for the following items, obtained from their catalog number 120; an ARW-2 Remote Control Receiver for 27-50mc FM, containing ten 10k relays, 14 tubes, 10 audio filter sections and a 24v power supply. Price is $15.00 for a used unit, or $19.95 for a new one. BC-611 Walkie-Talkie assembly, new and complete with telescoping antenna but less tubes, coils and crystals for $7.95 a pair. Originally designed for 3000-6000kc operation, these units make an excellent starting point for a 27mc Walkie-Talkie.

Citizen-ship has announced three new receivers and a transmitter. Receiver Model 3VTR is a 3-volt, fully transistorized tone job, measuring 1 x 1¾ x 2¾, and weighing three ounces. The idling current is said to be equal to the shelf life of the two pencells. Receiver SSTR is the first all transistorized superhet to reach the market. Photo shows this $69.95 receiver which measures 1-3/4" x 2-5/8" x 3-15/16" and operates from a single miniature 9-volt transistor battery. Channels are changed by merely plugging in the proper crystal. The third receiver, model SS-MSR-8, is the fully transistorized super-het version of their reliable 8-channel receiver. Operating from a single 15-volt hearing aid battery, this models weighs 12 ounces and measures 2-5/8 x 2-11/16 x 3-5/16 and frequency can be changed by changing the receiver crystal. Both of these new receivers can be had from stock on 27.045 or 27.145mc. Receivers 3VTR and SSTR will operate from the new CTX transmitter, the Citizen-ship REX or MST-8. The SS-MSR-8 receiver will operate from the MST-8 transmitter or any unit using the proper RF crystal. The new transmitter, Model CTX, is a dual purpose unit having but a 200ma filament drain. The MOPA circuit is extremely stable and will provide on-off carrier or on-off tone. Operatable on any of the five new spot frequencies, it sells for $39.95.

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Those of you interested in tinkering with RC on a larger scale can get the famous ARW-26 drone receiver for only $7.95 from the G & G Radio Supply Co., 51 Vesey Street, New York 7, N.Y. In working

(*Continued on page* 68)

condition, this unit contains relays, tubes and filters for 5-channel operation on about the 72mc spot.

• • •

Al Diem, 11111 Lund Place, Kensington, Md., has a new transistor converter transmitter supply shown in photo. This unit measures 1⅝ x 2⅜ x 3⅜ and weighs but four ounces. Quality parts and workmanship are used throughout with the rectifier being high-voltage silicon diodes. A unit suitable for the WAG TTPW system sells for $25 and a 140-volt model, suitable for Bramco, CG, Orbit and others is $20. Input is 6 volts, obtainable from an NT-6 wet cell, Saft cells or surplus nickle-cadmium cells from ESSE Radio. Tested with five Nicad cells (6.4v), the input current with no load is 350ma. With an output current of 30ma, which is about normal for most transmitters using a modulator, the output voltage is 140 volts and there is a drain of 900ma on the 6.4v input. We checked it out on a number of straight carrier and tone transmitters and operation of both converter and transmitter was very satisfactory. There is a controversy over whether a converter of this type or a vibrator type supply is better. It all depends on what you want and how much space you have available. This type converter has no moving parts, is lightweight and compact and quite shock resistant. The vibrator supply costs less.

• • •

Cobb Hobby's new Electro series actuators are the latest addition to their line of low cost, reliable units. These new units were designed to use in place of regular or compound escapements and can be obtained in Compound, 3-Position and S-N types. Weight is but 1⅛ ounces and they are said to be more than four times as powerful as other units tested. Pushrod linkage should simplify installation and an "electronic brake" prevents over-runs. We have not tested a unit yet. However, current drain is said to be less than one percent per flight, or, with two pencells you get 600-800 movements (one hour flying time), two medium cells 1500-1800 movements (two hours time) and two 250 MAH nickel-cadmium cells 2000-2500 movements or three hours time. Price is $8.95 for the S-N and 3-Position and $9.95 for the Compound.

• • •

The Micro-Switch Division of Minneapolis-Honeywell, Freeport, Ill., has a new switch which sounds like it could be applied to RC work. It is a 'One-Shot' switch that produces a *single* microsecond length pulse regardless of the speed of operation. The square wave pulse can be factory adjusted from .2 to 2.5 microseconds. Although a switch that could produce a single shot of short duration would be ideal for quick-blip controls, this particular switch is not for the average RC'er and is not in the low cost range. Write to Micro-Switch for Data Sheet 150.

• • •

New Babcock Magic Carpet Receiver Mark III. Measuring but ⅞" x 1⅜" x 2⅜" and weighing 1.7 ounces, this new receiver will operate from any carrier transmitter. Total flying weight with one 9 volt battery is but 2.4 ounces and the set will operate over a wide range of temperature. Four transistors are used and the famous Babcock Trans-Flex circuit gives more than ample reliability. This $27.95 unit should do much to popularize the ¼ A RC job.

• • •

Syracuse Sky Knights (Bill Kenyon, R.D. #2, Manlius, N.Y.) will hold their annual

(*Continued on page* 70)

BABCOCK'S
REVOLUTIONARY...NEW ALL-PLASTIC R/C PLANE KIT the "TRI-PACER"

CUTS ASSEMBLY TIME TO JUST A FEW HOURS!

37" wing span

For R/C
U-Control,
Free-Flight

Buy it today . . . Fly it tomorrow!

Another great Babcock-first! 37" wing span authentic model of the famous Piper Tri-Pacer . . . entirely pre-formed of new, fuel-proofed Hi-Impact plastic. Never before anything like it . . . no assembly or alignment problems . . . no covering or doping needed . . . completely decorated. You can assemble this beautiful flying model in a few short hours even if you've never built a plane before!

Designed for top R/C performance with Babcock equipment . . . also contains parts for U-control . . . stable and versatile for free flight too!

Model BTP complete Tri-Pacer Kit includes realistic shock-absorbing wheels, pre-formed landing gear, all pre-formed plastic parts, colorfully decorated. Easy-to-read plans; detailed instructions for assembly, installation of R/C equipment and flying.

Model BTP *Sensibly priced at* **$9.95**

"MAGIC WAND" TRANSMITTER

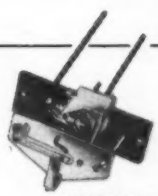
Powerful...reliable! Single channel 27.255 mc; 6⅞" x 2⅜" x 2⅜"; handiest hand-held size using full-size batteries.

BCT-10K
"Quick-Lace" Kit . . $19.95
BCT-10
Factory Assem. . . $24.95

"MAGIC CARPET" RECEIVER

Unmatched range and dependable performance. Reliable tube detection with transistor amplification...weighs only 2 oz.

BCR-10K
"Quick-Lace" Kit . . $21.95
BCR-10
Factory Assem. . . $26.95



"MARK II" SUPER-COMPOUND ESCAPEMENT, NO. 886

Rudder, elevator, motor control. All linkage furnished. All parts rust, corrosion proof. Weighs only ¾ oz. $7.95

world-famous R/C equipment precision-built by

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ADVERTISING INDEX – MAY, 1959

AMA sanctioned contest on June 28th. The RCNC group (Ed Reich, Jr., Box 4127, Winston-Salem, North Carolina) will hold their 5th annual three day session May 29th through 31st.

Dale Root is hitting the spot with no trouble with his dive brakes which extend 30 to 45 degrees from the side of the fuselage. Servo operated.

Sablar Special

(*Continued from page 24*)

you can understand the hand-rubbed finish on my 'Sablar Special'," says Tony.

The Special will break ground after a 700-800 foot run, and climb about 800 feet per minute. Cruise is 130 mph, top 150 mph, range 200 miles. Performance isn't quite what Tony wanted, but the present 85 horse Continental and McCauley prop (65 in. diameter, 56 in. pitch) will have to do for awhile. Like veteran pilots are wont to say, Tony thinks the Special flies like any other plane once off the ground. For the less experienced, it probably is on the hot side. Of course, many home-builts are true, easy-to-fly flivver planes.

Tony brings the Special over the fence at 100, touches down at 80—a lively approach speed for a typical cabin light plane! Very sensitive on the controls, Tony himself will tell you. Empty weight is 540 pounds, gross 810 pounds.

Anyone planning a home-built, Tony advises to join the Experimental Aircraft Association. "It is one organization open to the average man," Tony states, "and you don't have to own a $20,000 twin to read its publication, Sport Aviation. By belonging to EAA you can help further the cause of home-builts. And don't make a move without first contacting your local CAA (FAA) agent!"

MAN at Work

(*Continued from page 4*)

businessmen, but even the Cub now is a rich man's toy. Aviation simply forgot the sport flier and, incredibly, the fact that the great pleasure craft marine industry is based upon boating for fun. We suspect, and fondly hope, that EAA in the future will realize the revival of the kind of flying that the Wright Brothers invented, and which was dominant until December 7, 1941.

Membership in EAA costs $10 annually, $5 for junior members up to 18, and $5 for non-member subscription to Sport Aviation (Hales Corners, Wis.).

• • •

► How many multi-engine UC jobs are creamed on the first flight? Carrier Event rules now give a 5-pt. bonus, to compensate for greater drag of the unclean ship, and to make feasible two smaller all-purpose engines—and you know what two good big engines cost!

Ray Randall, a great hand at multi-engines and gadgetry, contributes these "secrets." First of all, a twin lets you cut the power in half for the slow-speed run and landing. With the inside engine running, you don't have to worry about the crate coming in on the lines. Ray uses a ¾ ounce tank on the outboard engine, good for about 12 laps after starting on a .35. He starts the inboard engine first.

"The center section must be strong," Ray states. "I use two 3/16" bass or spruce spars with 1/32" music wire, wrapped and fibre glassed to the top and bottom of the spars. Mounts tie to the spars with 1/16"

plywood bulkheads; the mounts are stiffened with 1/32" ply, which also ties into the spars, running forward to the front of the lugs and aft of the main gear, joints made with fibreglass resin. The 1/16" sheet balsa center section is covered with fibre glass cloth, doped on. A stiff center section is vital because a soft wing robs most of the power.

"Most builders have tried at least one multi-engined ship, only to have one motor quit in the air," Ray goes on. "This is caused by the vibration of two engines causing the tank sides to quiver and beat the fuel into a froth. I have licked this problem by enclosing tanks in a 1/16" hard balsa box lined with 3/16" foam rubber compressed to 1/8.

Since the torque of two .35's is potent, Ray warns that at least seven ounces of weight out just as far as possible on the outside wing is imperative!

• • •

► One result of the Hunter protest about alleged abuses in rules making procedures was a letter from AMA president, Dr. Walter Good, to Contest Board Members, asking for another CB poll. The gentlemen were told to consider possible loss of AMA membership if rules stood, as against loss if the rules were scuttled, and the vote of 22 CB members ran 15 to 7, in favor of the new FF power rule, and 18 to 4 for FF and UC classes, and wire sizes. We can hope now for by-laws modifications, for headquarters to do a better job of telling everyone how these things work (and beating their own drum), for no vindictiveness on the Coast because of the California Nationals, and a little less sweeping under the carpet of sworn-to protests about alleged builder-of-the-model rule infractions. The CB's had voted for a release (so far not made) of a Hatschek memo regarding the builder-of-the-model argument.

Perhaps now, we can clear up such alleged infractions at the Nationals which one highly competent observer put at twenty in 1958. Hang them on the spot.

• • •

Frank Beatty (the Ryan PT-22) says simple, gayly colored scale jobs usually won for him over highly detailed ships with workable turrets, etc. But then some joker would cream him with points garnered from an extra engine. At many contests, the point spread between several better models was often small. Judges evidently feel they've done their duty by throwing a few more points to a seemingly better airplane. Some meets develop their own point system. Since a few extra flight points then loom mighty large, Beatty stresses flying with his nifty PT.

At the Nats, Howard Ogden's beautiful FW 190 (fourth) was 67 points ahead of Beatty's PT. At smaller meets, canny Beatty topped the 190 by 30 points on several occasions. The throttle-flap control, via Roberts' control system did this for him. So Ogden installed Roberts' system and Beatty hasn't beat him since. The Roberts system shows up more often now in contributed plans. You may be missing something!

• • •

► Nieto drawings from MAN are available from the National Air Museum, Smithsonian Institution, Washington 25, D.C. Checks and money orders should be payable to the Smithsonian Institution. Prints are three times magazine page size, cost 75 cents each.

FOR A BEAUTIFUL MODEL - THRILLING PERFORMANCE

Berkeley's CHAMPIONSHIP "1/2A"

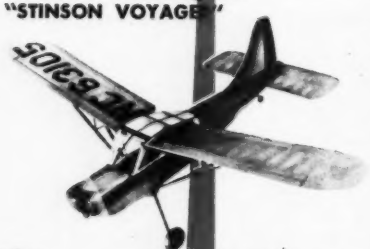
FLYING SCALE

First at Nationals - For 19 Years

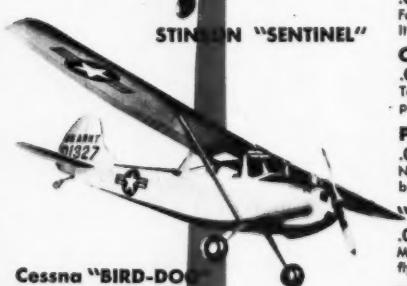
EXTRA DETAIL — EXTRA PRECISION — EXTRA FLYABILITY

"TEMCO" 150

"STINSON VOYAGER"



STINSON "SENTINEL"



Cessna "BIRD-DOG"

CESSNA "1

"AERONCA SEDAN"

"TEMCO" 150 30" Wingspan — 1" Scale **$3.95**
For Jetex "Jetmaster" or "Scorpion" Engines
A fine flying reaction engine powered design. The fuselage is balsa planked, molded celluloid parts.

"STINSON VOYAGER" 34" Wingspan — 1" Scale **$2.50**
.049 Engines Free-Flight — .049 to .099 Controline
Equipped with wing slots. A fine flying scale to start your collection off. Easy to build and trim.

STINSON "SENTINEL" 33⅓" Wingspan — 1" Scale **$2.50**
.049 Engines Free-Flight — .049 to .099 Controline
A consistant National's winner. An unusually fine design. Nice lines and ideal for building ease.

Cessna "BIRD-DOG" 36" Wingspan — 1" Scale **$2.95**
.049 Engines Free-Flight — .049 to .099 Controline
This fine liaison Korean War veteran is an excellent flyer, easy to build too, with sheet balsa siding.

CESSNA "180" 35" Wingspan — 1" Scale **$2.95**
.049 Engines Free-Flight — .049 to .099 Controline
Fine flying, easy to build from highly detailed full size plans. Authentic Decals, Rubber Wheels.

"AERONCA SEDAN" 34" Wingspan — 1" Scale **$2.50**
.049 Engines Free-Flight — .049 to .099 Controline
Plans show pontoon details. (Material for pontoons not included.) Authentic Decals, Wheels, Gear, etc.

AERONCA "C-3" 36" Wingspan — 1" Scale **$2.50**
.049 Engines Free-Flight — .049 to .099 Controline
Unusual in design, this model is an exact detailed replica of the prototype, popular in the thirties.

"WACO CABIN" 35" Wingspan — 1" Scale **$3.95**
.049 Engines Free-Flight — .049 to .099 Controline
Features Metal Ring Cowl, Decals, Detailed Plans. It's a beautiful flying biplane, easy to build too.

Colonial "SKIMMER" 33⅓" Wingspan — 1" Scale **$3.50**
.049 Engines Free-Flight — .049 to .099 Controline
Takes off water beautifully. Nothing like a high performance flying boat. Fine flyer, all balsa hull.

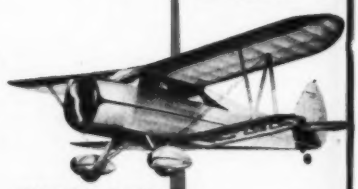
Piper "SUPER-CRUISER" 35" Wingspan — 1" Scale **$2.95**
.049 Engines Free-Flight — .049 to .099 Controline
National's winning design, a fine flyer. Easy to build, this fine model is a must for any collection.

"SUPER CADET" 35" Wingspan — 1" Scale **$2.95**
.049 to .099 Engines — .049 to .099 Controline
Many times a first place Nationals Winner, this fine flying scale design is a threat at any scale contest.

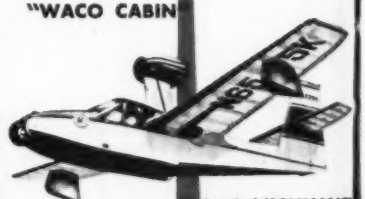
FAIRCHILD "24" RANCHER 36½" Wingspan **$2.50**
.049 Engines Free-Flight — .049 to .099 Controline
This strong reliable detailed scale design is very well proportioned for model flying. Easy to assemble too.

"BUHL-PUP" 37½" Wingspan — 1¼" Scale **$3.50**
.049 Engines Free-Flight — .049 to .099 Controline
Famous early light plane, makes a very fine flying scale model. Body balsa planked, authentic detail.

AERONCA "C-3"



"WACO CABIN"



Colonial "SKIMMER"

Piper "SUPER-CRUISER"

"SUPER CADET"

FAIRCHILD "24" RANCHER

"BUHL-PUP"

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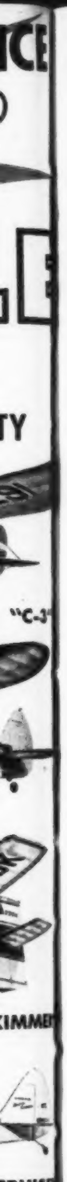
ICE
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"C-3"
KIMME
CRUISE
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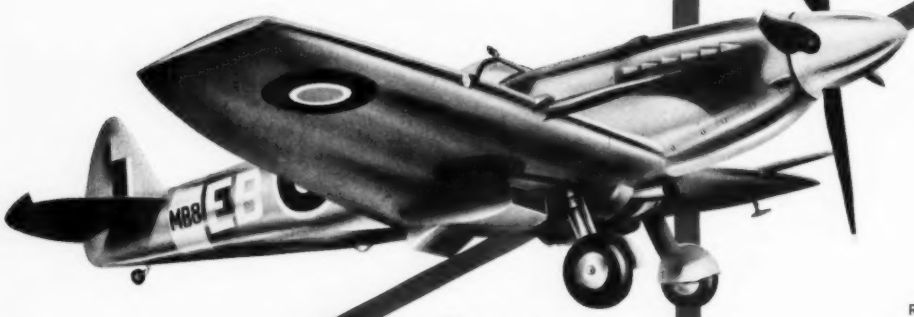
RANCH
UHL-PU

"MODELS OF THE MONTH" by Berkeley

ALL THREE KITS INCLUDE:

- Authentic Multi-color Decals
- All Necessary Hardware
- Full Size Detailed Plans
- Formed Wire Landing Gear
- Die-Cut Balsa

ROUNDED EDGE PLANKING



$5.95
Kit No. 5-8

Rated as one of the best fighters of World War II
- a rugged, thrilling, highly detailed, free flying controline
- a must for every flying scale collection.

Controliner

VICKERS SUPERMARINE "SPITFIRE"

For .09 to .15 Engines — ¾" Scale — 27½" Wingspan

Germany's answer to Britain's "Spitfire" - a sleek, powerful fighter, - a natural for controline flying.

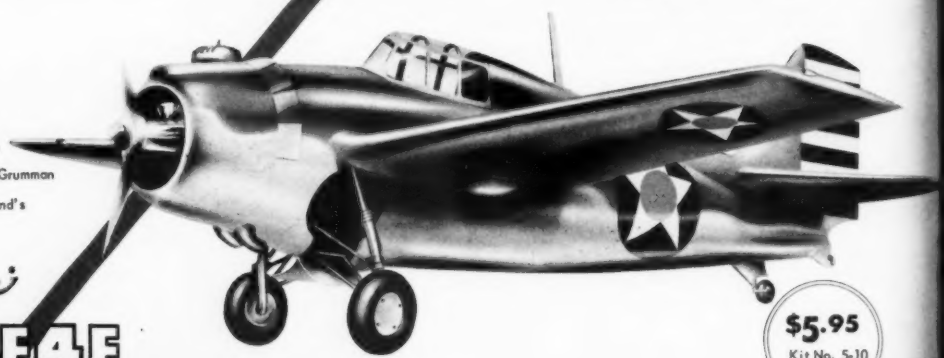
Try a scale dogfight for a real crowd pleaser.

FOCKE-WULF "190"

$5.95
Kit No. 5-9

Controliner

For .09 to .15 Engines — ¾" Scale — 25½" Wingspan



A natural for "Navy Carrier" - a highly maneuverable scale replica of the famous Grumman carrier fighter made famous at Wake Island's historic stand.

Controliner

GRUMMAN F4F "WILDCAT"

$5.95
Kit No. 5-10

For .09 to .15 Engines — ¾" Scale — 26" Wingspan

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